United States Stove Company

Project # 19-495
Model: 6041
AKA: 6041I, SP6000
Type: Pellet-Fired Room Heater
July 26, 2019
Revised: May 1, 2024

ASTM E2779 Standard Test Method for Determining Particulate Matter Emissions from Pellet Heaters

Contact: Mr. John Vorhees
227 Industrial Park Road
South Pittsburg, TN 37380
john.voorhees@usstove.com
(423) 837-2100 ext. 4513

Prepared by: Sebastian Button,
Laboratory Supervisor

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

Revision Summary

Date: 7/26/2019 – Original Issue

Date: 3/2/2021 – Made the following edits to address issues found during ADEC review process.

-Edited “notes” section on page 4 to clarify that conditioning data was performed by the manufacturer at a medium burn setting.

-Edited conditioning summary data sheet to indicate dates conditioning burns took place, see appendix A.

-Edited run data sheets to include precision calculations, see Appendix A.

-Edited test fuel properties section to clarify that the test fuel used a softwood variety of pellets.

-Edited run narrative, page 8, to clarify that the setting used for the low burn segment of the test is the lowest possible burn rate.

-The user manual was modified by the manufacturer to remove references to “multi-fuel” use, see Appendix B.

Date: 11/28/2023 – Made the following edits to the report.

-An updated manual was added to Appendix B to address proper use of air controls, see page 11 of manual.

-Updated analytical balance calibration sheet to show the unit was in calibration at the time of testing, see Non-CBI report page 108.

-Also included subsequent calibration sheet for the barometer used during testing showing the device was within tolerance in the “as received” condition after use, see page 114 of Non-CBI Report.

Date May 1, 2024: The following revisions were made to the report:

- Updated table of contents to include Appendices page numbers in Non-CBI report
- Owners manual updated to reflect required language in CFR regarding periodic inspection and repair – See page 5 of manual.
- Updated manual to refer to being tested with pellet fuel.

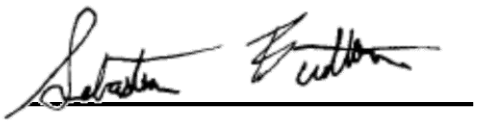
Contents

Affidavit

PFS-TECO was contracted by United States Stove Company to provide testing services for the 6041 Pellet-Fired Room Heater per ASTM E2779, *Determining PM Emissions from Pellet Heaters*. All testing and associated procedures were conducted at PFS-TECO's Portland Laboratory on 7/17/2019. PFS-TECO's Portland Laboratory is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 97015. Testing procedures followed ASTM E2779. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel.*

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

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



Sebastian Button, Laboratory Supervisor

Introduction

United States Stove Company of South Pittsburg, TN, contracted with PFS-TECO to perform EPA certification testing on 6041 Pellet-Fired Room Heater. All testing was performed at PFS-TECO's Portland Laboratory. Testing was performed by Mr. Sebastian Button.

Notes

- Prior to start of testing, 50 hours of conditioning was performed by the manufacturer at a medium air setting, per ASTM E2779
- 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 after the test began.
- A single, integrated test run, in accordance with ASTM E2779 was performed:
    - The medium burn rate setting used was the same as the low burn rate setting, as that is the only setting the yields a burn rate of <50% of the high burn rate, as required by ASTM E2779.

Pellet Heater Identification and Testing

- Appliance Tested: ***6041***
- Serial Number: ***4805F; PFS Tracking Number 0028***
- Manufacturer*:* ***United States Stove Company***
- Catalyst: ***No***
- Heat exchange blower: ***Integral***
- Type: ***Pellet Stove***
- Style: ***Free Standing***
- Date Received: ***Monday, June 03, 2019***
- Testing Period – Start: ***Wednesday, July 17, 2019*** Finish: ***Wednesday, July 17, 2019***
- Test Location: ***PFS-TECO Portland Laboratory, 11785 SE HWY 212 - Suite 305, Clackamas, OR 97015***
- Elevation: ***≈131 Feet above sea level***
- Test Technician(s): ***Sebastian Button***
- Observers: ***N/A***

Test Procedures and Equipment

All Sampling and analytical procedures were performed by Sebastian Button. All procedures used are directly from ASTM E2779 and ASTM E2515. See the list below for equipment used. See Appendix C submitted with this report for calibration data.

Equipment List:

Equipment ID#	Equipment Description
041	Rice Lake 3'x3' floor scale w/digital weight indicator
053	APEX XC-60 Digital Emissions Sampling Box A
054	APEX XC-60 Digital Emissions Sampling Box B
055	APEX Ambient sampling box
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
095	Anemometer
111	Microtector
SA17187	Gas Analyzer Calibration Span Gas
CC170624	Gas Analyzer Calibration Mid Gas

Results

The integrated test run emission rate for test Run 1 was measured to be **1.28 g/hr** with a Higher Heating Values efficiency of **57.6%** and a CO emission rate of **0.46 g/min.** The calculated first hour particulate emission rate was **0.33 g/hr.** The United States Stove Company Model 6041 Pellet-Fired Room Heater meets the 2020 PM emission standard of ≤ 2.0 g/hr per CFR 40 part 60, §60.532 (b).

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

Summary Table

EPA Application Table

Run Number	Date	Segments		Run Time (min)	Heat Output (BTU/hr)	1st Hr Emissions (g/hr)	Integrated Total (g/hr)	CO Emissions (g/min)	Overall CO Emissions (g/min)	Heating Efficiency (%HHV)	Overall Heating Efficiency (%HHV)
		Setting	BR								
1	7/17/2019	H	1.67	60	21811	0.33	1.28	0.58	0.46	67.4%	57.6%
		M	0.79	120	8311			0.48		54.2%	
		L	0.75	180	7540			0.42		52.1%	
		OA	0.92	360	10214			0.46		57.6%	

Test Run Narrative

Run 1

Run 1 was performed on 7/17/2019 as an attempted integrated test run per ASTM E2779. The overall test duration was 360 minutes. The particulate emissions rate for the integrated test run was 1.28 g/hr. The run had an overall HHV efficiency of 57.6%. The train A front filter was changed at 1 hr. All test results were appropriate and valid and the burn rate requirement for the integrated test run were achieved. There were no anomalies and all criteria were met. The control setting used for the low burn segment is the lowest possible setting available.

Test Conditions Summary

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

Runs	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	74	77	41.4	33.8	29.88	4.1	12.5	3.12	360

Appliance Operation and Test Settings

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

Settings & Run Notes

	Pre-Burn	Test Run
Run 1	Heat Setting #5	High Segment: Heat Setting #5 Medium Segment: Heat Setting #1 Low Segment: Heat Setting #1

Appliance Description

Model(s): 6041

Additional Models Discussion: In addition to the tested model, this design is offered under several different models by the manufacturer, including: 6041I and SP6000. The 6041I, as the name suggests, is an insert version of the free-standing model that was tested. The SP6000 model differs only in branding designation. All models utilize the same basic design with respect to performance and emission controls, differing only in their outward aesthetics. All models listed above are presumed to have the same emissions performance as the test specimen provided for certification.

Appliance Type: Pellet-Fired Room Heater

Air Introduction System: Air enters the burn chamber by being pulled though the firepot, via the exhaust blower, see air flow diagram in Appendix D.

Combustion Control: Feed rate is electronically controlled via user-selectable controls.

Baffles: N/A

Flue Outlet: 3-inch exhaust outlet located on the bottom/rear of the appliance.

Appliance Dimensions

6041 Dimensions

Height	Width	Depth	Firebox Volume
29”	27.75”	29.25	N/A – Pellet Stove

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

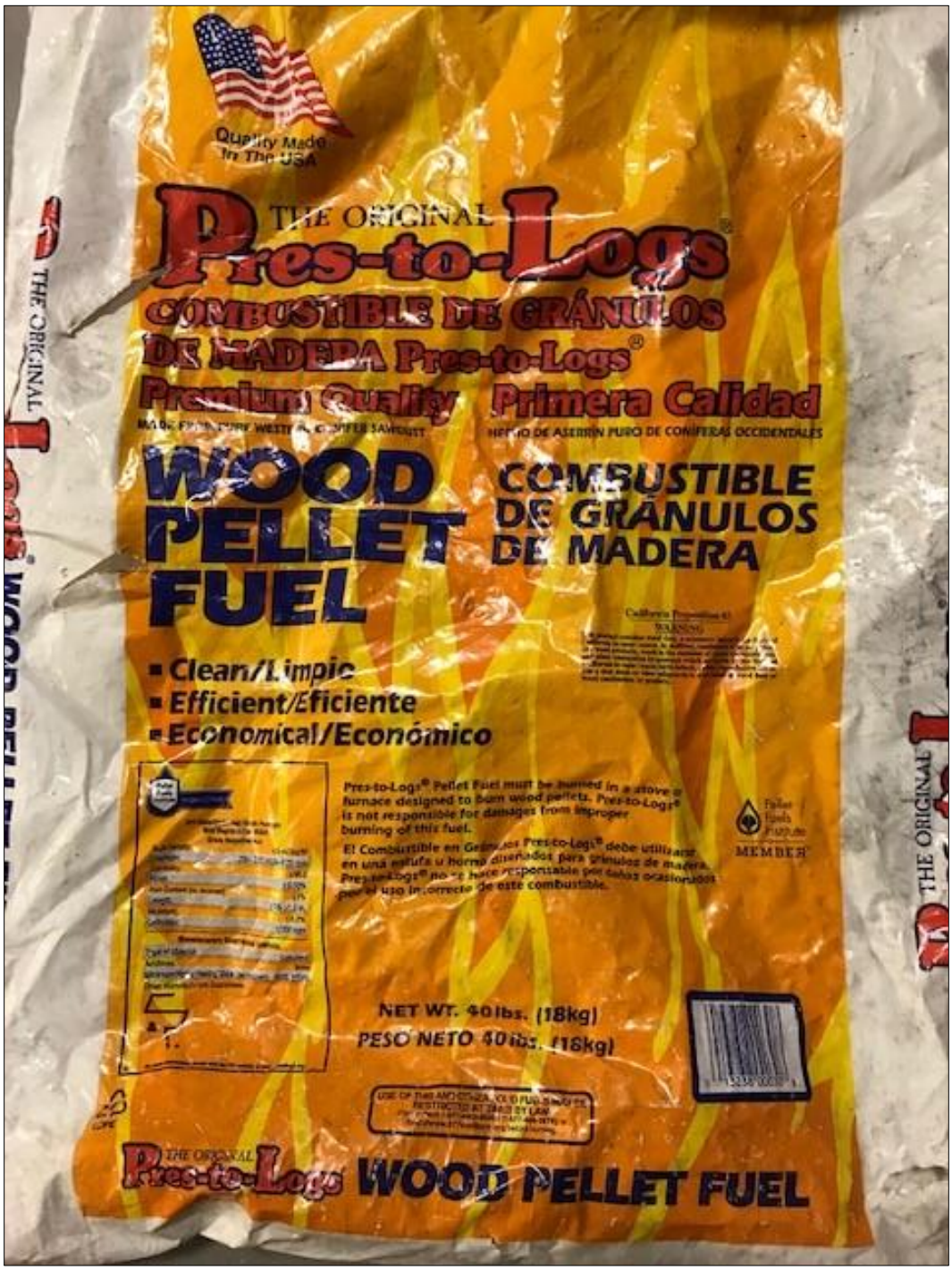
Appliance Front

Appliance Left

Appliance Right

Appliance Rear

Test Fuel Properties



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

Pellet Fuel Analysis

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

Analytical Test Report

Report No: USR:W218-0155-01
Issue No: 1

Client: PFS-TECO
11785 SE Hwy 212
Clackamas, OR 97015
Attention: Sebastian Button
PO No: S. Button

Signed:
Stephen Sundeen
Chemistry Laboratory Manager
Date of Issue: 2/27/2018

Sample Details

Sample Log No:	W218-0155-01	**Sample Date:**	
Sample Designation:	Presto Log - Pure Western Conife	**Sample Time:**	
Sample Recognized As:	Wood Pellets	**Arrival Date:**	2/15/2018

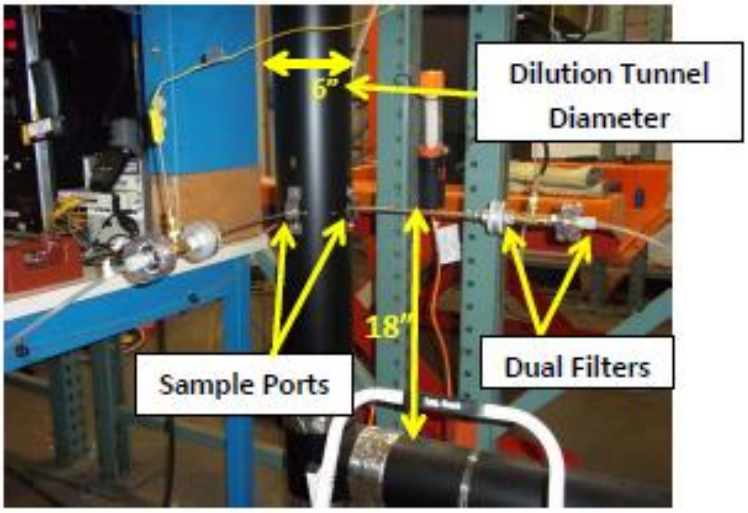
Test Results

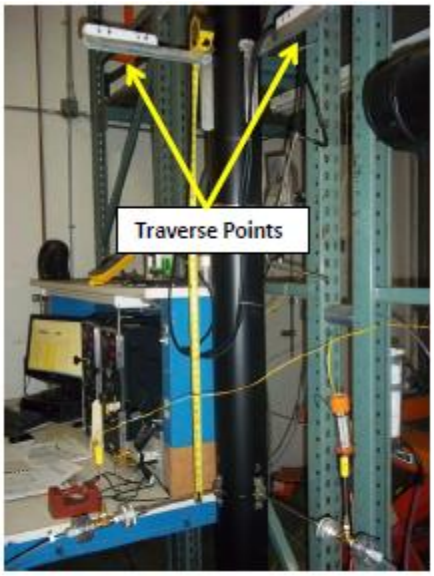
	METHOD	UNITS	MOISTURE FREE	AS RECEIVED
Moisture Total	ASTM E871	wt. %		3.03
Ash	ASTM D1102	wt. %	0.20	0.19
Volatile Matter	ASTM D3175	wt. %		
Fixed Carbon by Difference	ASTM D3172	wt. %		
Sulfur	ASTM D4239	wt. %	0.006	0.006
SO_2	Calculated	lb/mmbtu		0.013
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	19.07	18.42
Net Cal. Value at Const. Pressure	ISO 1928	J/g	19075	18424
Gross Cal. Value at Const. Vol.	ASTM E711	J/g	20397	19780
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8770	8504
Carbon	ASTM D5373	wt. %	50.57	49.04
Hydrogen*	ASTM D5373	wt. %	6.08	5.89
Nitrogen	ASTM D5373	wt. %	< 0.20	< 0.19
Oxygen*	ASTM D3176	wt. %	> 42.95	> 41.65
Chlorine	ASTM D6721	mg/kg		
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft^3		
Fines (Less than 1/8")	TPT CH-P-06	wt.%		
Durability Index	Kansas State	PDI		
Sample Above 1.50"	TPT CH-P-06	wt.%		
Maximum Length (Single Pellet)	TPT CH-P-06	inch		
Diameter, Range	TPT CH-P-05	inch		to
Diameter, Average	TPT CH-P-05	inch		
Stated Bag Weight	TPT CH-P-01	lbs		
Actual Bag Weight	TPT CH-P-01	lbs		

*Note: As received values do not include hydrogen and oxygen in the total moisture.

Comments

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.

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 E2780-10. Test method quality control procedures (leak checks, volume meter checks, stratification checks, proportionality results) followed the procedures outlined.

Appliance Sealing and Storage

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

Sealing Label

ATTENTION:

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

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

REPORT #_____ DATE SEALED_____

MANUFACTURER_____ MODEL #_____

Sealed Unit

List of Appendices

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

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

Appendix B – Labels and Manuals

Appendix C –Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

Appendix A: Test Run Data

Conditioning Data

Client:	US Stove	Job #:	19-495
Model:	6041	Tracking #:	028
Date(s):	May 2019	Technician:	SJB

		Average:	324.7	77.6	N/A
Elapsed Time (hrs)	**Scale Reading (lbs)**	**Weight Change (lbs)**	**Flue (°F)**	**Ambient (°F)**	**Catalyst Exit (°F)**
0	37.1	-	312	74	N/A
1	34.9	-2.2	321	78	N/A
2	32.8	-2.1	326	81	N/A
3	30.5	-2.3	323	83	N/A
4	51.8	21.3	326	86	N/A
5	49.5	-2.3	340	88	N/A
6	47.2	-2.3	340	88	N/A
7	45.0	-2.2	326	87	N/A
8	42.6	-2.4	341	83	N/A
9	40.3	-2.3	330	80	N/A
10	37.9	-2.4	331	78	N/A
11	35.6	-2.3	326	76	N/A
12	33.3	-2.3	324	74	N/A
13	31.0	-2.3	325	73	N/A
14	28.7	-2.3	319	73	N/A
15	26.5	-2.2	309	72	N/A
16	24.2	-2.3	309	70	N/A
17	22.0	-2.2	310	71	N/A
18	19.6	-2.4	320	69	N/A
19	17.4	-2.2	317	69	N/A
20	15.1	-2.3	306	64	N/A
21	13.0	-2.1	301	67	N/A
22	51.8	38.8	302	70	N/A
23	49.6	-2.2	316	72	N/A
24	47.5	-2.1	318	79	N/A
25	45.2	-2.3	324	82	N/A
26	42.9	-2.3	342	83	N/A
27	40.6	-2.3	335	84	N/A
28	56.4	15.8	330	84	N/A
29	54.1	-2.3	334	86	N/A
30	51.7	-2.4	348	89	N/A
31	49.4	-2.3	340	89	N/A
32	47.0	-2.4	341	88	N/A
33	44.6	-2.4	338	84	N/A
34	42.3	-2.3	326	82	N/A
35	39.9	-2.4	336	80	N/A
36	37.6	-2.3	331	78	N/A
37	35.2	-2.4	335	78	N/A
38	32.8	-2.4	329	78	N/A
39	30.5	-2.3	319	77	N/A
40	28.2	-2.3	324	77	N/A
41	25.8	-2.4	328	75	N/A
42	23.6	-2.2	324	74	N/A
43	21.3	-2.3	321	73	N/A
44	19.0	-2.3	317	64	N/A
45	16.7	-2.3	312	67	N/A
46	14.4	-2.3	309	69	N/A
47	12.2	-2.2	312	72	N/A
48	10.0	-2.2	328	76	N/A
49	7.7	-2.3	322	80	N/A
50	5.3	-2.4	334	82	N/A

Signature/Date:

PELLET TEST DATA PACKET
ASTM E2779/E2515

Run 1 Data Summary

Client:	US Stove Company
Model:	6041
Job #:	19-495
Tracking #:	028
Test Date:	7/17/2019

Techician Signature

3/2/2021
Date

TEST RESULTS - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

Burn Rate Summary	
High Burn Rate (dry kg/hr)	1.67
Medium Burn Rate (dry kg/hr)	0.79
Low Burn Rate (dry kg/hr)	0.75
Overall Burn Rate (dry kg/hr)	0.92

47.4% of High Burn Rate
44.7% of High Burn Rate

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	70.052	53.610	53.151	8.796
Average Gas Velocity in Dilution Tunnel (ft/sec)	15.2			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	9803.8			
Average Gas Meter Temperature (°F)	75.8	82.9	96.4	79.2
Total Sample Volume (dscf)	68.356	52.277	50.416	8.635
Average Tunnel Temperature (°F)	107.5			
Total Time of Test (min)	360			
Total Particulate Catch (mg)	0.1	6.7	6.8	0.3
Particulate Concentration, dry-standard (g/dscf)	0.0000015	0.0001282	0.0001349	0.0000347
Total PM Emissions (g)	0.09	7.45	7.85	0.33
Particulate Emission Rate (g/hr)	0.01	1.24	1.31	0.33
Emissions Factor (g/kg)	-	1.36	1.43	0.20
Difference from Average Total Particulate Emissions (g)	-	0.20	0.20	-
Difference from Average Total Particulate Emissions (%)	-	2.6%	2.6%	-
Difference from Average Emissions Factor (g/kg)	-	0.04	0.04	-

Final Average Results	
Total Particulate Emissions (g)	7.65
Particulate Emission Rate (g/hr)	1.28
Emissions Factor (g/kg)	1.39
HHV Efficiency (%)	57.6%
LHV Efficiency (%)	61.5%
CO Emissions (g/min)	0.46

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	80	OK
Face Velocity	< 30 ft/min	8.2	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min: 73 / Max: 77	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Medium Burn Rate	< 50% of High	47.4%	OK

Overall Pellet Test Efficiency Results

Manufacturer: US Stove Company
Model: 6041
Date: 07/17/19
Run: 1
Control #: 19-495
Test Duration: 360
Output Category: Integrated

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	57.6%	61.5%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	57.9%	61.9%

Output Rate (kJ/h)	10,768	10,214	**(Btu/h)**
Burn Rate (kg/h)	0.92	2.02	**(lb/h)**
Input (kJ/h)	18,697	17,736	**(Btu/h)**

Test Load Weight (dry kg)	5.50	12.12	**dry lb**
MC wet (%)	3.03		
MC dry (%)	3.12		
Particulate (g)	7.65		
CO (g)	166		
Test Duration (h)	6.00		

Emissions	Particulate	CO
g/MJ Output	0.12	2.57
g/kg Dry Fuel	1.39	30.23
g/h	1.28	27.71
g/min	0.02	0.46
lb/MM Btu Output	0.28	5.98

Air/Fuel Ratio (A/F)	45.90

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

Max Burn Rate Segment Efficiency Results

Manufacturer: US Stove Company
Model: 6041
Date: 07/17/19
Run: 1
Control #: 19-495
Test Duration: 60
Output Category: Maximum

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	67.4%	72.1%
Combustion Efficiency	99.4%	99.4%
Heat Transfer Efficiency	67.8%	72.5%

Output Rate (kJ/h)	22,992	21,811	**(Btu/h)**
Burn Rate (kg/h)	1.67	3.69	**(lb/h)**
Input (kJ/h)	34,103	32,351	**(Btu/h)**

Test Load Weight (dry kg)	1.67	3.69	**dry lb**
MC wet (%)	3.03		
MC dry (%)	3.12		
Particulate (g)	N/A		
CO (g)	35		
Test Duration (h)	1.00		

Emissions	Particulate	CO
g/MJ Output	N/A	1.50
g/kg Dry Fuel	N/A	20.64
g/h	N/A	34.50
g/min	N/A	0.58
lb/MM Btu Output	N/A	3.49

Air/Fuel Ratio (A/F)	24.01

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

Medium Burn Rate Segment Efficiency Results

Manufacturer: US Stove Company
Model: 6041
Date: 07/17/19
Run: 1
Control #: 19-495
Test Duration: 120
Output Category: Medium

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	54.2%	58.0%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	54.5%	58.3%

Output Rate (kJ/h)	8,762	8,311	**(Btu/h)**
Burn Rate (kg/h)	0.79	1.75	**(lb/h)**
Input (kJ/h)	16,154	15,324	**(Btu/h)**

Test Load Weight (dry kg)	1.58	3.49	**dry lb**
MC wet (%)	3.03		
MC dry (%)	3.12		
Particulate (g)	N/A		
CO (g)	57		
Test Duration (h)	2.00		

Emissions	**Particulate**	**CO**
g/MJ Output	N/A	3.26
g/kg Dry Fuel	N/A	36.10
g/h	N/A	28.59
g/min	N/A	0.48
lb/MM Btu Output	N/A	7.58

Air/Fuel Ratio (A/F)	49.64

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

Minimum Burn Rate Segment Efficiency Results

Manufacturer: US Stove Company
Model: 6041
Date: 07/17/19
Run: 1
Control #: 19-495
Test Duration: 180
Output Category: Minimum

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	52.1%	55.7%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	52.4%	56.0%

Output Rate (kJ/h)	7,948	7,540	**(Btu/h)**
Burn Rate (kg/h)	0.75	1.65	**(lb/h)**
Input (kJ/h)	15,257	14,473	**(Btu/h)**

Test Load Weight (dry kg)	2.24	4.95	**dry lb**
MC wet (%)	3.03		
MC dry (%)	3.12		
Particulate (g)	N/A		
CO (g)	75		
Test Duration (h)	3.00		

Emissions	Particulate	CO
g/MJ Output	N/A	3.15
g/kg Dry Fuel	N/A	33.50
g/h	N/A	25.05
g/min	N/A	0.42
lb/MM Btu Output	N/A	7.33

Air/Fuel Ratio (A/F)	61.55

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

DILUTION TUNNEL & MISC. DATA - ASTM E2779 / E2515

Client:	US Stove Company	Job #:	19-495
Model:	6041	Tracking #:	028
Run #:	1	Technician:	SJB
Test Start Time:	9:08	Date:	7/17/2019

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

Meter Box γ Factor:	0.999	(A)
Meter Box γ Factor:	0.996	(B)
Meter Box γ Factor:	0.992	(Ambient)

Induced Draft Check (in. H_2O):	0		
Smoke Capture Check (%):	100%		
Date Flue Pipe Last Cleaned:	7/15/2019		

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.9	29.86	29.88
Relative Humidity (%)	41.4	33.8	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		70.052	ft^3

Sample Train Post-Test Leak Checks

(A)	0.002	cfm @	-13	in. Hg
(B)	0.001	cfm @	-15	in. Hg
(Ambient)	0.003	cfm @	-14	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.038	114
2	0.054	114
3	0.058	114
4	0.040	114
5	0.038	114
6	0.050	114
7	0.054	114
8	0.038	114
Center	0.062	114

Static Pressure: -0.170 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}:	15.08	ft/sec
V_{scent}:	17.22	ft/sec
F_p:	0.876	[ratio]
Initial Tunnel Flow:	157.1	scf/min

TEST FUEL PROPERTIES

Default Fuel Values

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

Actual Fuel Used Properties

Pellet Brand:	Presto Log
Pellet Fuel Grade:	PFI Premium
HHV (kJ/kg)	20,397
%C	50.57
%H	6.08
%O	43.15
%Ash	0.2
MC (%DB)	3.12

PELLET STOVE PREBURN DATA - ASTM E2779

Client: US Stove Company
Job #: 19-495
Model: 6041
Tracking #: 028
Run #: 1
Technician: SJB
Date: 7/17/2019

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

		Average:	-0.044	375	73
Elapsed Time (min)	Scale Reading (lbs)	Weight Change (lbs)	Flue Draft (in H_2O)	Flue (°F)	Ambient (°F)
0	45.1	-	-0.019	123	74
1	45.1	0	-0.002	146	74
2	45.0	-0.1	-0.007	170	74
3	45.0	0	-0.017	196	73
4	44.9	-0.1	-0.029	226	73
5	44.8	-0.1	-0.027	256	73
6	44.7	-0.1	-0.036	294	73
7	44.5	-0.2	-0.054	334	73
8	44.3	-0.2	-0.034	360	73
9	44.2	-0.1	-0.043	368	73
10	44.2	0	-0.042	370	73
11	44.1	-0.1	-0.046	367	73
12	44.1	0	-0.042	368	73
13	44.0	-0.1	-0.044	368	73
14	44.0	0	-0.047	372	73
15	43.8	-0.2	-0.051	376	73
16	43.9	0.1	-0.045	379	73
17	43.8	-0.1	-0.041	380	73
18	43.7	-0.1	-0.043	384	73
19	43.7	0	-0.050	385	72
20	43.6	-0.1	-0.039	387	73
21	43.5	-0.1	-0.048	391	73
22	43.5	0	-0.040	390	73
23	43.4	-0.1	-0.063	391	73
24	43.3	-0.1	-0.044	393	73
25	43.2	-0.1	-0.042	396	73
26	43.2	0	-0.054	400	73
27	43.1	-0.1	-0.052	401	73
28	43.1	0	-0.037	401	73
29	43.0	-0.1	-0.047	400	73
30	43.0	0	-0.061	399	73
31	42.9	-0.1	-0.042	399	72
32	42.8	-0.1	-0.050	403	73
33	42.7	-0.1	-0.053	404	73
34	42.6	-0.1	-0.046	407	73
35	42.6	0	-0.041	409	73
36	42.5	-0.1	-0.051	410	73
37	42.4	-0.1	-0.049	411	73
38	42.4	0	-0.046	410	73
39	42.3	-0.1	-0.056	413	73
40	42.2	-0.1	-0.055	412	73
41	42.2	0	-0.036	414	73
42	42.1	-0.1	-0.044	415	74
43	42.0	-0.1	-0.053	416	73
44	42.0	0	-0.045	414	73
45	42.0	0	-0.054	412	73
46	41.9	-0.1	-0.046	412	73

PELLET STOVE PREBURN DATA - ASTM E2779

Client: US Stove Company
Job #: 19-495
Model: 6041
Tracking #: 028
Run #: 1
Technician: SJB
Date: 7/17/2019

47	41.8	-0.1	-0.050	412	73
48	41.7	-0.1	-0.056	412	74
49	41.7	0	-0.046	412	74
50	41.7	0	-0.034	412	74
51	41.4	-0.3	-0.053	410	73
52	41.5	0.1	-0.052	409	74
53	41.5	0	-0.034	409	73
54	41.4	-0.1	-0.052	407	74
55	41.2	-0.2	-0.048	405	74
56	41.2	0	-0.043	410	73
57	41.2	0	-0.042	409	73
58	41.1	-0.1	-0.053	410	73
59	41.1	0	-0.049	411	74
60	41.0	-0.1	-0.044	410	74

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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		0.060	0.02	78	-0.14		12.5		113	410	75	74
1	0.128	0.128	0.069	2.27	78	-0.9	84	12.5	0.0	113	407	75	73
2	0.273	0.145	0.060	2.26	78	0	102	12.4	-0.1	112	409	75	73
3	0.423	0.150	0.055	2.24	79	-1.02	110	12.3	-0.1	113	412	76	74
4	0.567	0.144	0.056	2.24	79	-2.19	105	12.3	0.0	112	412	75	73
5	0.715	0.148	0.064	2.22	78	0	101	12.2	-0.1	112	411	75	73
6	0.858	0.143	0.061	2.23	79	-2.19	99	12.1	-0.1	112	412	75	73
7	1.007	0.149	0.062	2.21	78	-1.26	103	12.1	0.0	113	411	76	73
8	1.149	0.142	0.064	2.21	78	-1.73	97	12.0	-0.1	113	413	76	73
9	1.298	0.149	0.064	2.20	78	-0.54	101	11.9	-0.1	113	415	76	74
10	1.441	0.143	0.065	2.18	78	0	97	11.7	-0.2	112	416	76	74
11	1.589	0.148	0.070	2.19	79	-0.86	96	11.8	0.1	113	417	76	74
12	1.732	0.143	0.075	2.21	78	-1.24	90	11.7	-0.1	113	418	76	74
13	1.880	0.148	0.069	2.17	78	0	97	11.7	0.0	113	422	76	74
14	2.022	0.142	0.060	2.19	79	-0.28	100	11.5	-0.2	113	421	76	73
15	2.171	0.149	0.064	2.20	78	-2.3	101	11.6	0.1	113	421	76	74
16	2.314	0.143	0.061	2.18	78	-2.23	100	11.5	-0.1	113	417	76	74
17	2.462	0.148	0.067	2.19	79	-2.33	98	11.4	-0.1	113	419	76	74
18	2.605	0.143	0.064	2.16	79	0	97	11.4	0.0	114	422	76	74
19	2.752	0.147	0.066	2.17	79	-0.12	98	11.3	-0.1	113	422	76	74
20	2.895	0.143	0.061	2.18	79	-0.75	100	11.2	-0.1	114	418	76	73
21	3.041	0.146	0.068	2.17	79	-1.29	96	11.2	0.0	113	418	76	74
22	3.185	0.144	0.070	2.18	79	-0.05	94	11.1	-0.1	113	419	76	74
23	3.331	0.146	0.061	2.16	79	-0.16	102	11.0	-0.1	113	421	76	73
24	3.474	0.143	0.062	2.16	80	0	99	11.0	0.0	113	424	76	74
25	3.619	0.145	0.061	2.15	80	0	101	10.9	-0.1	113	426	76	74
26	3.764	0.145	0.060	2.16	79	-0.11	102	10.9	0.0	113	423	76	74
27	3.909	0.145	0.077	2.15	79	-2.12	90	10.8	-0.1	113	422	76	74
28	4.055	0.146	0.066	2.16	80	-2.16	98	10.7	-0.1	114	420	76	74
29	4.199	0.144	0.066	2.13	79	-1.84	96	10.7	0.0	114	418	76	74
30	4.346	0.147	0.068	2.25	79	-0.65	97	10.6	-0.1	113	418	76	74
31	4.494	0.148	0.068	2.24	79	0	98	10.5	-0.1	113	416	76	74
32	4.643	0.149	0.058	2.24	79	0	106	10.5	0.0	112	418	76	74

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	4.790	0.147	0.066	2.26	80	-0.74	98	10.4	-0.1	112	417	76	74
34	4.939	0.149	0.062	2.25	79	0	103	10.3	-0.1	112	422	76	74
35	5.087	0.148	0.066	2.24	79	-1.66	99	10.3	0.0	113	421	77	74
36	5.235	0.148	0.058	2.23	78	-0.16	106	10.1	-0.2	113	423	76	74
37	5.385	0.150	0.061	2.24	79	-1.38	104	10.1	0.0	113	423	76	74
38	5.532	0.147	0.059	2.25	80	-0.17	104	10.1	0.0	113	424	76	75
39	5.681	0.149	0.066	2.25	80	-0.1	100	10.0	-0.1	113	424	76	74
40	5.828	0.147	0.075	2.25	80	0	92	10.0	0.0	113	423	77	74
41	5.978	0.150	0.064	2.24	80	-1.74	102	9.9	-0.1	113	421	77	74
42	6.125	0.147	0.064	2.22	80	-0.55	100	9.8	-0.1	113	423	77	74
43	6.275	0.150	0.064	2.24	79	-0.89	102	9.8	0.0	113	423	77	74
44	6.421	0.146	0.065	2.24	80	-0.82	98	9.7	-0.1	113	425	77	74
45	6.571	0.150	0.060	2.25	80	-1.15	105	9.6	-0.1	113	425	77	74
46	6.716	0.145	0.060	2.25	80	-1.49	102	9.6	0.0	113	424	77	75
47	6.868	0.152	0.061	2.21	80	-1.43	106	9.4	-0.2	113	426	77	74
48	7.013	0.145	0.063	2.22	80	-2.23	99	9.3	-0.1	113	425	77	74
49	7.164	0.151	0.064	2.23	80	0	102	9.3	0.0	113	427	77	75
50	7.309	0.145	0.063	2.23	80	-0.3	99	9.3	0.0	112	427	77	74
51	7.461	0.152	0.055	2.23	80	0	111	9.2	-0.1	112	425	77	75
52	7.607	0.146	0.055	2.24	80	-1.02	107	9.2	0.0	113	424	77	74
53	7.759	0.152	0.066	2.24	80	-2.15	102	9.1	-0.1	113	424	77	75
54	7.905	0.146	0.059	2.23	80	-0.97	103	9.0	-0.1	114	424	77	75
55	8.056	0.151	0.075	2.24	81	-0.04	95	9.0	0.0	114	426	77	75
56	8.202	0.146	0.066	2.22	80	-2.14	98	8.9	-0.1	113	425	77	75
57	8.353	0.151	0.058	2.22	80	-1.81	108	8.8	-0.1	113	423	77	75
58	8.499	0.146	0.059	2.24	80	-0.72	103	8.8	0.0	113	425	77	75
59	8.649	0.150	0.061	2.23	80	-1.63	104	8.7	-0.1	114	423	77	75
60	8.796	0.147	0.063	2.24	80	0	101	8.7	0.0	114	423	77	75
61	8.950	0.154	0.068	2.29	81	-2.21	101	8.7	0.0	114	422	77	75
62	9.099	0.149	0.066	2.24	81	0	99	8.5	-0.2	114	424	77	75
63	9.248	0.149	0.063	2.24	81	-2.02	102	8.5	0.0	114	422	77	75
64	9.398	0.150	0.058	2.24	81	-0.02	107	8.4	-0.1	113	418	77	75
65	9.546	0.148	0.063	2.21	81	-1.08	101	8.4	0.0	112	416	77	75

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.697	0.151	0.058	2.23	81	-2.09	107	8.3	-0.1	112	413	77	75
67	9.843	0.146	0.061	2.24	81	-2.2	101	8.4	0.1	112	410	77	75
68	9.995	0.152	0.062	2.23	81	-2.28	104	8.3	-0.1	112	409	77	75
69	10.141	0.146	0.069	2.23	82	-0.67	95	8.3	0.0	112	405	77	75
70	10.292	0.151	0.064	2.22	81	-0.08	102	8.2	-0.1	112	403	77	75
71	10.439	0.147	0.072	2.22	81	0	94	8.2	0.0	111	402	78	75
72	10.592	0.153	0.064	2.24	81	-2.12	104	8.2	0.0	112	397	78	75
73	10.738	0.146	0.063	2.23	81	-0.65	99	8.2	0.0	111	395	78	75
74	10.890	0.152	0.070	2.22	81	-1	98	8.1	-0.1	111	394	78	75
75	11.037	0.147	0.072	2.24	81	-2.29	94	8.1	0.0	111	392	78	75
76	11.188	0.151	0.066	2.25	81	-1.36	101	8.1	0.0	111	391	78	75
77	11.335	0.147	0.060	2.23	81	-0.62	103	8.0	-0.1	110	389	77	75
78	11.486	0.151	0.061	2.24	82	0	104	8.0	0.0	111	384	77	75
79	11.634	0.148	0.067	2.25	81	-1.3	98	8.1	0.1	110	382	78	75
80	11.783	0.149	0.059	2.25	81	-2.08	105	7.9	-0.2	110	383	78	75
81	11.934	0.151	0.065	2.24	82	-2.21	101	7.9	0.0	111	380	78	75
82	12.083	0.149	0.058	2.23	81	-0.96	106	7.8	-0.1	110	380	78	75
83	12.233	0.150	0.064	2.24	81	-0.67	101	7.9	0.1	109	375	78	75
84	12.381	0.148	0.061	2.24	81	-0.07	102	7.7	-0.2	110	372	78	75
85	12.532	0.151	0.069	2.24	81	-0.09	98	7.8	0.1	110	375	78	75
86	12.678	0.146	0.072	2.23	82	-0.92	93	7.7	-0.1	109	373	78	75
87	12.831	0.153	0.063	2.23	82	-0.94	104	7.7	0.0	110	370	78	75
88	12.977	0.146	0.066	2.23	81	-0.02	97	7.8	0.1	110	369	78	75
89	13.129	0.152	0.067	2.24	82	-2.22	100	7.6	-0.2	110	367	78	75
90	13.277	0.148	0.072	2.23	82	0	94	7.6	0.0	110	374	78	75
91	13.429	0.152	0.063	2.22	82	-1.53	103	7.6	0.0	110	373	78	75
92	13.576	0.147	0.062	2.23	82	0	101	7.6	0.0	110	368	78	75
93	13.728	0.152	0.056	2.23	82	-2.2	110	7.6	0.0	110	371	78	75
94	13.875	0.147	0.065	2.22	82	-1.46	98	7.5	-0.1	109	365	78	75
95	14.026	0.151	0.069	2.25	82	-2.21	98	7.5	0.0	109	367	77	75
96	14.174	0.148	0.075	2.25	82	-2.28	92	7.4	-0.1	109	363	78	75
97	14.324	0.150	0.061	2.22	82	-0.03	103	7.4	0.0	109	359	78	75
98	14.474	0.150	0.062	2.22	82	-2.21	103	7.4	0.0	109	357	78	75

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	14.624	0.150	0.057	2.24	82	-1.94	107	7.4	0.0	109	359	78	75
100	14.774	0.150	0.070	2.23	82	-0.76	97	7.3	-0.1	108	355	78	75
101	14.923	0.149	0.067	2.25	82	-2.3	98	7.2	-0.1	109	353	78	75
102	15.074	0.151	0.059	2.26	82	0	106	7.3	0.1	109	348	78	76
103	15.220	0.146	0.065	2.22	82	-2.24	98	7.2	-0.1	109	354	78	76
104	15.373	0.153	0.073	2.22	82	-0.81	96	7.2	0.0	109	350	78	75
105	15.519	0.146	0.068	2.22	82	0	95	7.1	-0.1	109	350	78	76
106	15.672	0.153	0.063	2.24	82	-0.2	104	7.1	0.0	109	351	78	76
107	15.820	0.148	0.073	2.24	82	-1.94	93	7.1	0.0	108	345	78	76
108	15.972	0.152	0.073	2.23	82	-0.59	96	7.1	0.0	108	344	78	76
109	16.120	0.148	0.068	2.24	82	0	97	7.1	0.0	108	340	78	76
110	16.271	0.151	0.068	2.25	82	-2.24	99	7.0	-0.1	108	337	78	76
111	16.419	0.148	0.066	2.24	82	-2.27	98	7.0	0.0	107	338	78	76
112	16.569	0.150	0.071	2.23	82	-2.2	96	7.0	0.0	107	333	78	76
113	16.718	0.149	0.059	2.24	82	-1.31	104	7.0	0.0	107	328	78	76
114	16.869	0.151	0.069	2.21	82	-2.19	98	6.8	-0.2	107	326	78	76
115	17.020	0.151	0.065	2.20	83	-2.08	101	6.9	0.1	107	325	77	76
116	17.168	0.148	0.060	2.23	83	-2.13	103	6.9	0.0	107	322	78	76
117	17.320	0.152	0.064	2.24	82	-0.2	102	6.9	0.0	107	320	78	76
118	17.466	0.146	0.070	2.24	82	-1.86	94	6.8	-0.1	106	317	78	76
119	17.619	0.153	0.068	2.23	82	-0.45	100	6.8	0.0	106	324	78	75
120	17.765	0.146	0.064	2.23	82	-2.13	98	6.9	0.1	106	325	78	76
121	17.918	0.153	0.063	2.23	83	-0.03	103	6.7	-0.2	106	324	78	76
122	18.066	0.148	0.074	2.23	82	-0.75	93	6.7	0.0	107	324	78	76
123	18.218	0.152	0.073	2.22	82	-0.11	96	6.6	-0.1	106	323	78	76
124	18.366	0.148	0.057	2.23	83	0	105	6.7	0.1	107	318	78	76
125	18.517	0.151	0.060	2.23	83	-0.45	105	6.6	-0.1	106	318	78	76
126	18.665	0.148	0.064	2.24	83	0	99	6.6	0.0	106	317	78	76
127	18.816	0.151	0.069	2.25	83	-0.27	98	6.5	-0.1	106	315	78	76
128	18.965	0.149	0.066	2.23	83	0	98	6.5	0.0	107	315	78	76
129	19.115	0.150	0.059	2.25	83	-0.24	105	6.5	0.0	106	314	78	76
130	19.266	0.151	0.065	2.22	83	-2.2	100	6.4	-0.1	106	313	78	75
131	19.415	0.149	0.065	2.23	83	-2.06	99	6.5	0.1	105	313	78	76

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	19.567	0.152	0.067	2.24	83	-0.95	100	6.5	0.0	105	309	78	76
133	19.714	0.147	0.068	2.24	83	0	96	6.4	-0.1	106	310	78	76
134	19.866	0.152	0.052	2.25	83	-2.11	113	6.4	0.0	105	312	78	75
135	20.012	0.146	0.059	2.24	83	-2.27	102	6.3	-0.1	105	311	78	76
136	20.165	0.153	0.069	2.23	83	-2.2	99	6.2	-0.1	105	308	78	76
137	20.313	0.148	0.068	2.24	83	-0.35	96	6.3	0.1	105	305	78	75
138	20.466	0.153	0.064	2.22	83	-1.81	102	6.2	-0.1	105	311	78	76
139	20.613	0.147	0.066	2.21	83	-2.1	97	6.1	-0.1	105	313	78	75
140	20.765	0.152	0.066	2.24	83	-1.31	100	6.2	0.1	105	311	78	75
141	20.912	0.147	0.068	2.23	83	-2.28	96	6.2	0.0	105	310	78	75
142	21.063	0.151	0.063	2.24	83	-0.62	102	6.0	-0.2	105	312	78	75
143	21.212	0.149	0.062	2.24	83	-1.5	101	6.1	0.1	105	310	78	75
144	21.363	0.151	0.055	2.23	83	-2.2	109	6.1	0.0	106	309	78	76
145	21.514	0.151	0.056	2.23	83	-1.05	108	6.1	0.0	106	308	78	75
146	21.663	0.149	0.062	2.23	83	0	101	6.0	-0.1	105	303	78	75
147	21.815	0.152	0.067	2.23	83	0	100	5.9	-0.1	105	303	78	75
148	21.961	0.146	0.060	2.23	83	-1.39	101	6.0	0.1	105	306	78	75
149	22.114	0.153	0.065	2.24	83	-1.53	102	6.0	0.0	105	306	78	75
150	22.260	0.146	0.061	2.24	83	-2.36	100	5.9	-0.1	105	299	78	75
151	22.413	0.153	0.071	2.22	83	-1.66	97	5.9	0.0	105	302	78	76
152	22.561	0.148	0.067	2.23	83	-1.67	97	5.9	0.0	105	308	78	76
153	22.714	0.153	0.066	2.23	83	-2.04	101	5.8	-0.1	105	301	78	75
154	22.862	0.148	0.067	2.23	83	-0.07	97	5.8	0.0	105	302	78	75
155	23.013	0.151	0.061	2.23	83	-1.61	104	5.8	0.0	105	305	78	76
156	23.160	0.147	0.063	2.21	83	-0.42	99	5.8	0.0	105	305	78	76
157	23.312	0.152	0.066	2.23	83	-0.2	100	5.7	-0.1	105	299	78	76
158	23.461	0.149	0.063	2.23	83	-0.79	101	5.7	0.0	106	303	78	76
159	23.611	0.150	0.063	2.23	83	0	101	5.6	-0.1	105	303	78	76
160	23.762	0.151	0.060	2.22	83	-2.23	105	5.7	0.1	106	303	78	75
161	23.911	0.149	0.060	2.23	83	-0.86	103	5.6	-0.1	105	304	78	76
162	24.063	0.152	0.067	2.22	83	-2.36	100	5.6	0.0	105	301	78	76
163	24.209	0.146	0.062	2.23	83	-1.1	99	5.6	0.0	105	303	78	76
164	24.362	0.153	0.071	2.25	83	-1.15	97	5.5	-0.1	106	304	78	76

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	24.508	0.146	0.061	2.23	83	-1.04	100	5.5	0.0	105	303	78	76
166	24.662	0.154	0.063	2.22	83	0	104	5.5	0.0	105	300	78	76
167	24.809	0.147	0.066	2.22	83	-1.48	97	5.5	0.0	105	301	78	76
168	24.962	0.153	0.067	2.22	83	-2.18	100	5.4	-0.1	105	296	78	76
169	25.110	0.148	0.073	2.25	83	-1.34	93	5.4	0.0	105	296	78	76
170	25.261	0.151	0.071	2.24	83	-0.93	96	5.4	0.0	105	298	78	75
171	25.409	0.148	0.059	2.23	83	-2.28	103	5.3	-0.1	105	304	79	76
172	25.560	0.151	0.064	2.23	83	-0.69	101	5.3	0.0	105	304	79	75
173	25.709	0.149	0.065	2.23	83	-2.27	99	5.3	0.0	105	302	78	75
174	25.859	0.150	0.070	2.23	83	-1.72	96	5.3	0.0	105	304	78	75
175	26.010	0.151	0.063	2.22	83	-1.31	102	5.2	-0.1	105	302	79	76
176	26.159	0.149	0.066	2.23	83	-2.35	98	5.2	0.0	105	300	79	76
177	26.311	0.152	0.063	2.22	83	-0.38	103	5.2	0.0	105	300	78	75
178	26.457	0.146	0.058	2.24	83	-0.26	103	5.2	0.0	105	300	79	76
179	26.610	0.153	0.065	2.25	83	-2.02	102	5.1	-0.1	105	299	79	76
180	26.756	0.146	0.060	2.24	83	0	101	5.1	0.0	105	294	79	75
181	26.909	0.153	0.069	2.21	83	-1.53	99	5.1	0.0	105	295	79	75
182	27.057	0.148	0.068	2.21	83	-0.01	96	5.0	-0.1	105	297	79	76
183	27.209	0.152	0.062	2.23	83	-0.03	103	5.0	0.0	105	294	79	76
184	27.357	0.148	0.062	2.21	83	-1.42	101	5.0	0.0	105	294	79	76
185	27.508	0.151	0.071	2.22	83	-1.46	96	4.9	-0.1	105	294	79	76
186	27.655	0.147	0.066	2.24	83	-2.21	97	4.9	0.0	105	293	79	76
187	27.807	0.152	0.071	2.23	83	-1.25	97	4.9	0.0	105	301	79	76
188	27.955	0.148	0.058	2.23	83	-2.26	104	4.9	0.0	105	298	79	76
189	28.106	0.151	0.060	2.21	84	-0.95	104	4.8	-0.1	105	295	78	76
190	28.257	0.151	0.060	2.21	83	-0.81	104	4.8	0.0	105	300	78	76
191	28.405	0.148	0.063	2.21	84	-1.1	100	4.8	0.0	105	296	79	76
192	28.557	0.152	0.069	2.20	83	-0.34	98	4.8	0.0	104	294	79	76
193	28.704	0.147	0.056	2.23	84	-0.3	105	4.7	-0.1	105	296	79	76
194	28.855	0.151	0.064	2.21	83	-0.05	101	4.7	0.0	104	299	79	76
195	29.002	0.147	0.061	2.22	84	-0.31	101	4.7	0.0	104	296	79	76
196	29.154	0.152	0.071	2.21	84	-2.12	96	4.6	-0.1	105	297	79	76
197	29.302	0.148	0.073	2.22	84	-0.96	93	4.6	0.0	105	296	79	76

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	29.454	0.152	0.067	2.21	84	0	99	4.6	0.0	105	298	79	76
199	29.601	0.147	0.061	2.21	84	-0.69	101	4.6	0.0	105	293	79	76
200	29.754	0.153	0.071	2.20	84	0	97	4.6	0.0	105	295	79	76
201	29.901	0.147	0.063	2.23	84	-0.17	99	4.5	-0.1	104	292	79	76
202	30.051	0.150	0.066	2.22	84	-0.72	99	4.5	0.0	104	292	79	76
203	30.200	0.149	0.055	2.22	84	-2.21	107	4.5	0.0	105	292	79	76
204	30.349	0.149	0.057	2.21	84	-1.94	106	4.5	0.0	105	290	79	76
205	30.499	0.150	0.066	2.20	84	-2.21	99	4.4	-0.1	104	293	79	76
206	30.649	0.150	0.062	2.20	84	0	102	4.4	0.0	105	293	79	76
207	30.800	0.151	0.061	2.20	84	-2.15	103	4.4	0.0	105	294	79	76
208	30.948	0.148	0.061	2.21	84	-2.29	101	4.2	-0.2	105	296	79	76
209	31.099	0.151	0.062	2.21	84	-0.74	103	4.2	0.0	105	298	79	76
210	31.246	0.147	0.061	2.23	84	0	101	4.3	0.1	105	297	79	76
211	31.398	0.152	0.070	2.21	84	-1.18	97	4.2	-0.1	105	295	79	76
212	31.544	0.146	0.071	2.21	84	-1.4	93	4.2	0.0	105	296	79	76
213	31.696	0.152	0.056	2.21	84	-0.02	109	4.2	0.0	105	299	79	76
214	31.843	0.147	0.061	2.20	84	-2.32	101	4.1	-0.1	105	300	79	76
215	31.996	0.153	0.061	2.20	84	0	105	4.1	0.0	105	300	79	76
216	32.142	0.146	0.065	2.22	84	-0.13	97	4.1	0.0	105	296	79	76
217	32.295	0.153	0.057	2.20	84	-0.79	108	4.1	0.0	105	298	79	76
218	32.441	0.146	0.061	2.21	84	-0.37	100	3.9	-0.2	105	303	79	76
219	32.592	0.151	0.070	2.21	84	0	97	4.0	0.1	106	304	79	76
220	32.740	0.148	0.063	2.22	84	-2.44	100	4.0	0.0	106	303	79	76
221	32.891	0.151	0.067	2.21	84	-0.36	99	4.0	0.0	106	303	79	76
222	33.040	0.149	0.066	2.19	84	-0.02	98	3.9	-0.1	105	303	79	76
223	33.190	0.150	0.064	2.18	84	-1.53	100	3.9	0.0	105	302	79	76
224	33.340	0.150	0.065	2.20	84	-0.67	100	3.9	0.0	105	299	79	76
225	33.488	0.148	0.061	2.20	84	-0.05	101	3.8	-0.1	105	297	79	76
226	33.639	0.151	0.072	2.17	85	-0.19	95	3.6	-0.2	105	299	79	76
227	33.786	0.147	0.068	2.22	84	-2.26	95	3.8	0.2	105	296	79	76
228	33.937	0.151	0.063	2.22	84	-0.05	102	3.8	0.0	105	290	79	76
229	34.084	0.147	0.065	2.21	85	-0.05	97	3.7	-0.1	105	296	79	77
230	34.236	0.152	0.053	2.20	84	-1.79	112	3.7	0.0	105	296	79	76

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	34.382	0.146	0.067	2.20	84	-2.35	95	3.7	0.0	104	293	79	77
232	34.535	0.153	0.064	2.19	85	0	102	3.7	0.0	104	295	79	76
233	34.682	0.147	0.053	2.18	85	-0.39	108	3.6	-0.1	104	293	79	77
234	34.833	0.151	0.073	2.19	84	-0.57	95	3.6	0.0	105	295	79	77
235	34.980	0.147	0.068	2.19	85	-0.18	95	3.5	-0.1	105	296	79	77
236	35.132	0.152	0.063	2.19	85	-2.34	102	3.5	0.0	105	300	79	77
237	35.278	0.146	0.071	2.21	84	-2.35	93	3.5	0.0	105	300	79	77
238	35.429	0.151	0.066	2.18	84	-0.16	99	3.5	0.0	105	299	79	77
239	35.577	0.148	0.060	2.18	84	-2.13	102	3.3	-0.2	105	299	79	77
240	35.726	0.149	0.060	2.21	84	0	103	3.4	0.1	105	299	79	77
241	35.875	0.149	0.053	2.19	84	-0.76	109	3.4	0.0	105	292	79	77
242	36.025	0.150	0.065	2.19	84	-2.18	100	3.4	0.0	105	297	79	77
243	36.175	0.150	0.057	2.20	84	-0.07	106	3.3	-0.1	106	301	79	77
244	36.323	0.148	0.070	2.18	84	-1.73	95	3.3	0.0	106	300	79	77
245	36.474	0.151	0.060	2.16	84	-0.35	104	3.3	0.0	106	301	79	77
246	36.621	0.147	0.071	2.19	84	-2.26	93	3.2	-0.1	105	296	79	77
247	36.771	0.150	0.067	2.19	85	-2.02	98	3.2	0.0	105	297	79	77
248	36.917	0.146	0.070	2.18	84	-0.44	93	3.2	0.0	106	298	79	77
249	37.069	0.152	0.074	2.19	84	-1.83	95	3.2	0.0	105	297	79	77
250	37.215	0.146	0.067	2.19	85	-2.33	95	3.1	-0.1	106	302	79	77
251	37.367	0.152	0.060	2.18	84	-0.05	105	3.1	0.0	105	301	79	77
252	37.513	0.146	0.071	2.19	84	-0.07	93	3.1	0.0	105	302	79	77
253	37.665	0.152	0.059	2.17	84	-0.72	106	3.0	-0.1	106	304	79	77
254	37.812	0.147	0.068	2.19	84	-2.26	95	3.0	0.0	105	302	79	77
255	37.963	0.151	0.057	2.19	84	-0.15	107	2.9	-0.1	105	306	80	77
256	38.110	0.147	0.064	2.20	85	-0.07	98	2.8	-0.1	106	305	79	77
257	38.260	0.150	0.055	2.20	84	-0.92	108	2.9	0.1	106	305	80	77
258	38.406	0.146	0.065	2.20	85	-0.26	97	2.9	0.0	106	308	79	77
259	38.557	0.151	0.066	2.17	84	-0.39	100	2.8	-0.1	106	306	79	77
260	38.704	0.147	0.063	2.18	85	-2.37	99	2.8	0.0	107	306	79	77
261	38.854	0.150	0.068	2.17	85	-2.07	97	2.8	0.0	106	305	79	77
262	39.002	0.148	0.071	2.18	85	-1.3	94	2.9	0.1	106	305	79	77
263	39.151	0.149	0.063	2.19	84	-0.03	101	2.6	-0.3	106	305	79	77

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	39.301	0.150	0.072	2.16	85	-0.78	94	2.7	0.1	106	306	79	77
265	39.449	0.148	0.061	2.19	85	-1.24	101	2.7	0.0	106	305	79	77
266	39.599	0.150	0.064	2.18	85	-0.55	100	2.7	0.0	106	301	79	77
267	39.747	0.148	0.062	2.18	84	-0.5	101	2.6	-0.1	106	300	80	77
268	39.897	0.150	0.065	2.18	85	-2.27	99	2.6	0.0	106	303	80	77
269	40.042	0.145	0.062	2.18	84	-0.16	99	2.6	0.0	106	299	80	77
270	40.193	0.151	0.068	2.18	85	-2.2	98	2.6	0.0	106	297	79	77
271	40.339	0.146	0.061	2.18	85	-0.3	100	2.5	-0.1	106	295	80	77
272	40.490	0.151	0.058	2.18	85	-0.65	106	2.5	0.0	106	301	80	77
273	40.636	0.146	0.067	2.17	85	-0.71	95	2.4	-0.1	105	297	80	77
274	40.788	0.152	0.057	2.18	86	-0.5	107	2.4	0.0	105	297	80	77
275	40.934	0.146	0.062	2.19	85	-0.01	99	2.4	0.0	106	298	80	77
276	41.085	0.151	0.061	2.16	85	-1.56	103	2.4	0.0	106	300	80	77
277	41.231	0.146	0.060	2.17	85	-0.12	101	2.3	-0.1	106	302	80	77
278	41.382	0.151	0.072	2.19	85	-0.63	95	2.3	0.0	106	307	80	77
279	41.529	0.147	0.071	2.15	85	-2.36	93	2.3	0.0	106	306	80	77
280	41.679	0.150	0.057	2.18	85	-0.96	106	2.3	0.0	106	306	80	77
281	41.825	0.146	0.066	2.17	85	-2.28	96	2.2	-0.1	106	303	80	77
282	41.975	0.150	0.060	2.19	85	-0.15	103	2.2	0.0	106	299	80	77
283	42.122	0.147	0.059	2.15	85	-2.31	102	2.2	0.0	106	301	80	77
284	42.272	0.150	0.060	2.18	85	-0.21	104	2.1	-0.1	107	304	80	77
285	42.419	0.147	0.064	2.17	85	-0.17	98	2.1	0.0	107	302	80	77
286	42.568	0.149	0.067	2.16	85	-0.04	97	2.1	0.0	107	302	80	77
287	42.716	0.148	0.065	2.16	85	-1.44	98	2.0	-0.1	106	300	80	77
288	42.865	0.149	0.068	2.17	85	-2.39	97	2.0	0.0	107	300	80	77
289	43.014	0.149	0.063	2.17	85	-1.12	100	2.0	0.0	106	300	80	77
290	43.162	0.148	0.056	2.17	85	-1.39	106	1.9	-0.1	106	300	80	77
291	43.311	0.149	0.059	2.16	85	-0.84	104	1.9	0.0	106	306	80	77
292	43.458	0.147	0.061	2.16	85	-0.4	101	1.9	0.0	106	300	80	77
293	43.609	0.151	0.063	2.16	85	-0.33	102	1.9	0.0	105	295	80	77
294	43.755	0.146	0.060	2.17	86	-0.79	101	1.8	-0.1	106	299	80	77
295	43.905	0.150	0.058	2.23	85	-2.33	105	1.8	0.0	106	298	80	77
296	44.053	0.148	0.065	2.23	85	-1.52	98	1.8	0.0	106	296	80	77

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	44.205	0.152	0.063	2.23	85	-2.46	102	1.7	-0.1	106	299	80	77
298	44.352	0.147	0.068	2.22	85	-2.23	95	1.7	0.0	105	301	80	77
299	44.505	0.153	0.058	2.21	85	-2.33	107	1.7	0.0	106	306	80	77
300	44.652	0.147	0.061	2.21	85	-2.39	101	1.6	-0.1	107	304	80	77
301	44.805	0.153	0.062	2.20	85	-2.42	104	1.6	0.0	107	303	80	77
302	44.952	0.147	0.070	2.21	85	-0.45	94	1.6	0.0	106	301	80	77
303	45.103	0.151	0.066	2.21	85	-2.49	99	1.5	-0.1	106	299	80	77
304	45.251	0.148	0.060	2.23	85	-0.24	102	1.5	0.0	106	299	80	77
305	45.401	0.150	0.056	2.19	85	-2.55	107	1.5	0.0	106	301	80	77
306	45.550	0.149	0.071	2.21	85	-1.24	94	1.5	0.0	106	295	80	77
307	45.700	0.150	0.061	2.21	85	-0.14	103	1.4	-0.1	106	295	80	77
308	45.851	0.151	0.064	2.21	85	-1.58	101	1.4	0.0	106	301	80	77
309	45.999	0.148	0.061	2.20	86	-0.59	101	1.4	0.0	106	299	80	77
310	46.151	0.152	0.059	2.20	85	-2.23	106	1.4	0.0	106	296	80	77
311	46.297	0.146	0.061	2.22	85	-0.81	100	1.4	0.0	106	303	80	77
312	46.449	0.152	0.066	2.22	85	-1.74	100	1.3	-0.1	106	304	80	77
313	46.596	0.147	0.067	2.21	85	-0.14	96	1.3	0.0	106	300	80	77
314	46.748	0.152	0.058	2.21	85	-0.05	107	1.3	0.0	106	302	80	77
315	46.895	0.147	0.068	2.21	85	-0.57	95	1.2	-0.1	106	302	80	77
316	47.048	0.153	0.060	2.19	85	-2.44	106	1.2	0.0	106	301	80	77
317	47.195	0.147	0.067	2.22	85	-0.48	96	1.2	0.0	106	303	80	77
318	47.347	0.152	0.062	2.22	85	-1.89	103	1.2	0.0	107	305	80	77
319	47.494	0.147	0.055	2.23	85	-0.88	106	1.1	-0.1	107	301	80	77
320	47.644	0.150	0.067	2.22	85	-0.1	98	1.1	0.0	107	303	80	77
321	47.792	0.148	0.060	2.21	85	-2.42	102	1.1	0.0	106	305	80	77
322	47.942	0.150	0.072	2.20	85	-1.7	95	1.0	-0.1	107	303	80	77
323	48.092	0.150	0.062	2.20	85	-0.27	102	1.0	0.0	106	301	80	77
324	48.241	0.149	0.064	2.19	85	-1.78	100	1.0	0.0	106	302	80	77
325	48.392	0.151	0.057	2.20	85	-1.61	107	1.0	0.0	107	305	80	77
326	48.540	0.148	0.070	2.19	85	-1.98	95	0.9	-0.1	106	301	80	77
327	48.692	0.152	0.068	2.20	85	-0.21	99	0.9	0.0	106	304	80	77
328	48.838	0.146	0.066	2.21	85	-2.29	96	0.8	-0.1	106	304	80	77
329	48.989	0.151	0.070	2.17	85	-0.13	96	0.8	0.0	106	300	80	77

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	49.136	0.147	0.069	2.20	85	-1.79	95	0.8	0.0	106	300	80	77
331	49.287	0.151	0.059	2.19	85	-0.24	105	0.7	-0.1	106	298	80	77
332	49.434	0.147	0.067	2.19	85	-0.56	96	0.8	0.1	106	297	80	77
333	49.587	0.153	0.054	2.18	85	-0.25	111	0.7	-0.1	107	300	80	77
334	49.733	0.146	0.060	2.19	85	-0.35	101	0.7	0.0	106	298	80	77
335	49.885	0.152	0.070	2.17	85	-1.9	97	0.7	0.0	106	298	80	77
336	50.033	0.148	0.066	2.20	85	-2.47	97	0.6	-0.1	106	304	80	77
337	50.183	0.150	0.058	2.20	85	-2.3	105	0.6	0.0	107	303	80	77
338	50.330	0.147	0.061	2.21	85	-1.69	101	0.5	-0.1	106	300	80	77
339	50.480	0.150	0.068	2.20	85	-2.46	97	0.5	0.0	106	301	80	77
340	50.628	0.148	0.060	2.19	85	-1.68	102	0.5	0.0	106	297	80	77
341	50.778	0.150	0.061	2.19	85	-1.23	103	0.5	0.0	106	294	80	77
342	50.928	0.150	0.064	2.19	85	-1.85	100	0.5	0.0	106	296	80	77
343	51.077	0.149	0.064	2.19	85	-1.39	100	0.2	-0.3	106	303	80	77
344	51.227	0.150	0.069	2.19	85	-1.29	97	0.4	0.2	106	304	80	77
345	51.374	0.147	0.063	2.18	85	-2.24	99	0.4	0.0	106	303	80	77
346	51.526	0.152	0.070	2.17	85	-0.07	97	0.4	0.0	106	299	80	77
347	51.672	0.146	0.060	2.19	85	-2.21	101	0.3	-0.1	106	302	80	77
348	51.823	0.151	0.065	2.19	85	-2.51	100	0.3	0.0	107	307	80	77
349	51.969	0.146	0.064	2.20	85	-1.77	98	0.3	0.0	107	304	80	77
350	52.120	0.151	0.065	2.18	85	-0.22	100	0.2	-0.1	107	307	80	77
351	52.267	0.147	0.070	2.19	85	-2.38	94	0.2	0.0	107	303	80	77
352	52.420	0.153	0.057	2.17	85	-1.95	108	0.2	0.0	107	299	80	77
353	52.566	0.146	0.059	2.17	85	-2.32	102	0.2	0.0	106	297	80	77
354	52.718	0.152	0.065	2.19	85	-1.64	101	0.1	-0.1	107	301	80	77
355	52.865	0.147	0.066	2.17	85	-0.3	97	0.1	0.0	107	301	80	77
356	53.016	0.151	0.073	2.19	85	-2.23	95	0.1	0.0	107	303	80	77
357	53.162	0.146	0.062	2.19	85	-2.42	99	0.0	-0.1	107	302	80	77
358	53.313	0.151	0.057	2.18	85	-0.42	107	0.0	0.0	106	301	80	77
359	53.461	0.148	0.073	2.19	85	-1.5	93	0.0	0.0	107	299	80	77
360	53.610	0.149	0.066	2.19	85	-1.42	98	0.0	0.0	106	301	80	77
Avg/Tot	53.610	0.149	0.064	2.21	83	-1.11	100			108	333	78	76

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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		75	0.000	4.79	0.08
1	0.120	0.120	2.25	78	-2.48	81	75	-0.060	4.21	0.06
2	0.265	0.145	2.22	78	-0.74	105	76	-0.060	4.47	0.09
3	0.411	0.146	2.22	78	-1.04	111	77	-0.060	5.03	0.06
4	0.554	0.143	2.21	78	-0.84	108	77	-0.050	4.89	0.04
5	0.701	0.147	2.21	78	-2.41	103	76	-0.040	4.68	0.08
6	0.844	0.143	2.18	78	-0.77	103	76	-0.040	4.70	0.07
7	0.991	0.147	2.19	79	-2.42	105	76	-0.050	4.65	0.07
8	1.134	0.143	2.19	79	-0.96	100	75	-0.060	5.42	0.07
9	1.280	0.146	2.18	79	-2.31	103	75	-0.050	4.92	0.11
10	1.422	0.142	2.18	79	-1.81	99	75	-0.050	5.77	0.04
11	1.568	0.146	2.17	79	-1.16	98	76	-0.050	5.07	0.06
12	1.709	0.141	2.18	80	-0.82	91	77	-0.050	4.78	0.09
13	1.855	0.146	2.16	80	-1.63	99	77	-0.050	5.60	0.05
14	1.997	0.142	2.17	80	-0.74	103	77	-0.050	4.99	0.05
15	2.143	0.146	2.15	80	-0.98	102	76	-0.060	5.01	0.07
16	2.286	0.143	2.17	80	-1.55	103	76	-0.050	4.45	0.08
17	2.431	0.145	2.18	81	-1.54	99	75	-0.050	5.09	0.06
18	2.574	0.143	2.17	81	-1.99	100	75	-0.070	5.18	0.04
19	2.718	0.144	2.15	81	-2.28	99	75	-0.050	5.70	0.08
20	2.861	0.143	2.16	82	-1.04	102	75	-0.060	4.37	0.08
21	3.004	0.143	2.14	82	-2.16	97	77	-0.050	4.66	0.09
22	3.149	0.145	2.14	82	-2.08	97	77	-0.050	5.31	0.09
23	3.291	0.142	2.14	82	-0.8	102	77	-0.060	5.20	0.11
24	3.437	0.146	2.15	83	-0.67	103	77	-0.050	5.05	0.11
25	3.579	0.142	2.15	83	-0.95	101	76	-0.050	5.56	0.11
26	3.725	0.146	2.15	83	-0.79	105	76	-0.060	4.30	0.10
27	3.866	0.141	2.14	84	-2.09	89	75	-0.050	4.33	0.10
28	4.012	0.146	2.15	84	-1.88	100	75	-0.050	4.77	0.08
29	4.153	0.141	2.13	84	-1.76	97	75	-0.050	4.50	0.07
30	4.299	0.146	2.15	84	-1.92	99	75	-0.050	4.97	0.09
31	4.441	0.142	2.14	85	-1.64	96	76	-0.050	4.22	0.09

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	4.587	0.146	2.15	85	-1.02	106	77	-0.050	5.52	0.09
33	4.730	0.143	2.15	85	-0.94	98	77	-0.060	4.81	0.08
34	4.875	0.145	2.15	86	-2.37	102	77	-0.050	5.53	0.10
35	5.018	0.143	2.14	86	-1.58	98	76	-0.060	5.17	0.09
36	5.162	0.144	2.13	86	-2.44	105	76	-0.050	5.28	0.06
37	5.306	0.144	2.13	86	-2.46	102	76	-0.060	5.23	0.08
38	5.449	0.143	2.13	87	-0.93	103	75	-0.050	5.33	0.11
39	5.594	0.145	2.14	87	-0.75	99	75	-0.050	5.06	0.12
40	5.737	0.143	2.14	87	-1.77	91	75	-0.040	5.18	0.05
41	5.882	0.145	2.14	87	-0.71	100	76	-0.050	4.59	0.13
42	6.025	0.143	2.14	88	-2.45	99	77	-0.070	5.21	0.11
43	6.172	0.147	2.15	88	-2.43	102	77	-0.040	5.51	0.07
44	6.313	0.141	2.14	88	-0.8	97	77	-0.050	6.12	0.06
45	6.460	0.147	2.14	88	-2.44	105	76	-0.050	5.24	0.09
46	6.601	0.141	2.13	89	-2.43	100	76	-0.040	4.93	0.08
47	6.748	0.147	2.14	89	-1.61	104	76	-0.050	5.26	0.09
48	6.889	0.141	2.12	89	-1.25	98	75	-0.040	5.10	0.06
49	7.036	0.147	2.14	89	-1.37	101	75	-0.060	5.80	0.08
50	7.179	0.143	2.13	89	-0.78	99	75	-0.050	5.05	0.09
51	7.325	0.146	2.12	90	-2.42	108	75	-0.040	4.76	0.09
52	7.468	0.143	2.14	90	-1.36	106	77	-0.040	4.84	0.10
53	7.614	0.146	2.14	90	-0.79	99	77	-0.050	5.09	0.11
54	7.758	0.144	2.15	90	-1.84	103	77	-0.060	4.42	0.17
55	7.903	0.145	2.13	90	-1.97	92	77	-0.050	5.81	0.09
56	8.047	0.144	2.13	91	-2.44	97	76	-0.040	4.65	0.13
57	8.191	0.144	2.14	91	-1.77	104	76	-0.070	4.66	0.10
58	8.336	0.145	2.13	91	-2.31	104	76	-0.060	5.37	0.08
59	8.479	0.143	2.12	91	-2.45	101	75	-0.050	4.71	0.09
60	8.624	0.145	2.13	91	-0.72	101	75	-0.050	5.11	0.08
61	8.768	0.144	2.13	92	-1.58	96	75	-0.050	4.50	0.12
62	8.916	0.148	2.25	92	-1.53	100	76	-0.050	4.64	0.08
63	9.063	0.147	2.24	92	-2.04	102	77	-0.060	4.53	0.11

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.213	0.150	2.23	92	-0.74	108	77	-0.050	3.57	0.13
65	9.361	0.148	2.24	92	-2.49	102	77	-0.050	4.15	0.10
66	9.510	0.149	2.24	92	-1.73	107	77	-0.050	3.38	0.06
67	9.659	0.149	2.25	92	-1.71	105	76	-0.050	3.30	0.12
68	9.807	0.148	2.24	93	-2.31	103	76	-0.050	3.59	0.07
69	9.956	0.149	2.24	93	-1.78	98	76	-0.050	3.20	0.07
70	10.104	0.148	2.26	93	-1.01	101	75	-0.050	3.77	0.05
71	10.254	0.150	2.25	93	-1.98	97	75	-0.050	3.45	0.10
72	10.400	0.146	2.26	93	-0.75	100	75	-0.050	2.93	0.10
73	10.550	0.150	2.25	93	-1.94	103	75	-0.050	3.52	0.06
74	10.697	0.147	2.26	93	-0.86	96	77	-0.060	3.58	0.08
75	10.848	0.151	2.24	93	-2.06	97	77	-0.060	2.80	0.09
76	10.994	0.146	2.25	94	-2.26	98	77	-0.050	3.00	0.08
77	11.145	0.151	2.24	94	-1.94	106	76	-0.050	3.15	0.07
78	11.292	0.147	2.24	94	-1.95	103	76	-0.060	2.94	0.10
79	11.443	0.151	2.25	94	-0.98	101	76	-0.050	2.76	0.06
80	11.590	0.147	2.25	94	-1.08	104	76	-0.050	3.66	0.11
81	11.741	0.151	2.24	94	-0.81	102	75	-0.040	2.66	0.11
82	11.888	0.147	2.26	94	-1.64	105	75	-0.040	3.06	0.07
83	12.038	0.150	2.24	94	-2.4	102	75	-0.050	2.86	0.10
84	12.184	0.146	2.24	94	-2.04	102	76	-0.050	2.32	0.11
85	12.335	0.151	2.23	95	-2.5	99	77	-0.050	3.18	0.04
86	12.482	0.147	2.25	95	-0.77	94	77	-0.040	3.05	0.07
87	12.632	0.150	2.25	95	-2.44	103	77	-0.050	2.48	0.08
88	12.780	0.148	2.24	95	-0.98	99	76	-0.050	2.65	0.07
89	12.930	0.150	2.26	95	-1.83	100	76	-0.060	2.87	0.05
90	13.079	0.149	2.24	95	-0.88	96	76	-0.040	3.06	0.05
91	13.228	0.149	2.24	95	-1.78	102	75	-0.050	2.63	0.09
92	13.377	0.149	2.25	95	-0.84	103	75	-0.050	2.33	0.11
93	13.526	0.149	2.27	95	-2.37	108	75	-0.040	2.91	0.08
94	13.675	0.149	2.24	95	-1.94	101	76	-0.040	2.52	0.07
95	13.822	0.147	2.25	95	-2.14	96	77	-0.040	2.84	0.08

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	13.973	0.151	2.24	95	-1.78	95	77	-0.040	2.70	0.08
97	14.120	0.147	2.24	96	-2.38	102	77	-0.040	2.34	0.05
98	14.271	0.151	2.24	96	-1.05	104	76	-0.040	2.03	0.06
99	14.418	0.147	2.25	96	-1.14	106	76	-0.040	2.75	0.10
100	14.569	0.151	2.25	96	-1.33	98	76	-0.050	2.46	0.07
101	14.716	0.147	2.24	96	-2.48	98	76	-0.040	2.17	0.10
102	14.867	0.151	2.24	96	-1.81	107	75	-0.060	2.15	0.09
103	15.014	0.147	2.22	96	-1.3	99	75	-0.040	2.92	0.04
104	15.166	0.152	2.25	96	-1.82	97	75	-0.040	2.26	0.09
105	15.312	0.146	2.24	96	-2.44	96	76	-0.040	2.97	0.06
106	15.463	0.151	2.23	96	-1.62	103	77	-0.040	2.40	0.09
107	15.610	0.147	2.24	96	-1.93	93	77	-0.040	2.00	0.10
108	15.760	0.150	2.25	96	-1.94	95	77	-0.040	1.98	0.09
109	15.908	0.148	2.23	96	-1.83	97	77	-0.040	2.24	0.05
110	16.059	0.151	2.23	97	-2.52	99	76	-0.040	1.85	0.06
111	16.208	0.149	2.25	97	-2.51	99	76	-0.050	2.25	0.09
112	16.357	0.149	2.24	97	-2.34	96	76	-0.040	1.94	0.10
113	16.507	0.150	2.24	97	-2.43	106	76	-0.040	1.96	0.07
114	16.655	0.148	2.24	97	-2.39	96	75	-0.040	2.14	0.05
115	16.805	0.150	2.23	97	-1.98	101	75	-0.040	2.11	0.06
116	16.952	0.147	2.23	97	-0.84	103	75	-0.030	2.01	0.05
117	17.103	0.151	2.24	97	-2.43	102	76	-0.040	2.01	0.07
118	17.250	0.147	2.24	97	-1.8	95	77	-0.040	1.71	0.07
119	17.401	0.151	2.24	97	-0.82	99	77	-0.040	2.26	0.08
120	17.548	0.147	2.23	97	-2.15	99	77	-0.030	2.38	0.04
121	17.700	0.152	2.22	97	-1.27	104	76	-0.040	2.14	0.07
122	17.847	0.147	2.24	97	-2.14	92	76	-0.040	1.84	0.07
123	17.999	0.152	2.24	97	-1.95	96	76	-0.030	2.19	0.07
124	18.145	0.146	2.23	98	-2.11	104	76	-0.030	2.07	0.05
125	18.296	0.151	2.24	97	-0.81	105	75	-0.030	1.99	0.03
126	18.443	0.147	2.24	97	-1.08	99	75	-0.040	2.21	0.06
127	18.594	0.151	2.24	97	-2.02	98	75	-0.040	1.92	0.11

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	18.741	0.147	2.24	98	-1.93	98	75	-0.030	1.73	0.04
129	18.892	0.151	2.24	98	-2.51	106	76	-0.040	2.45	0.03
130	19.041	0.149	2.23	98	-2.26	100	77	-0.020	1.99	0.07
131	19.190	0.149	2.24	98	-2.3	100	77	-0.040	2.22	0.08
132	19.340	0.150	2.24	98	-2.43	99	76	-0.030	1.51	0.08
133	19.489	0.149	2.24	98	-2.2	97	76	-0.030	2.05	0.03
134	19.639	0.150	2.24	98	-0.82	112	76	-0.040	1.88	0.07
135	19.786	0.147	2.24	98	-1.4	103	76	-0.040	2.31	0.05
136	19.937	0.151	2.24	98	-2.44	98	76	-0.030	1.63	0.06
137	20.084	0.147	2.23	98	-2.38	96	75	-0.030	1.55	0.09
138	20.235	0.151	2.22	98	-2.06	102	75	-0.050	2.46	0.07
139	20.383	0.148	2.25	98	-1.05	98	75	-0.040	2.29	0.03
140	20.535	0.152	2.24	98	-0.84	101	77	-0.040	1.97	0.10
141	20.681	0.146	2.24	98	-2.46	95	77	-0.050	1.78	0.09
142	20.833	0.152	2.23	98	-0.95	103	77	-0.040	1.96	0.09
143	20.980	0.147	2.24	98	-1.84	101	77	-0.060	1.79	0.10
144	21.130	0.150	2.24	98	-1.09	109	77	-0.040	1.96	0.05
145	21.278	0.148	2.24	98	-1.48	107	76	-0.030	2.07	0.07
146	21.428	0.150	2.24	98	-0.82	103	76	-0.040	1.79	0.07
147	21.576	0.148	2.22	98	-2.32	97	76	-0.040	1.76	0.07
148	21.727	0.151	2.24	98	-2.03	105	75	-0.030	2.38	0.06
149	21.876	0.149	2.24	98	-2.48	100	75	-0.030	2.29	0.06
150	22.025	0.149	2.24	98	-2.05	103	75	-0.040	1.17	0.09
151	22.175	0.150	2.23	98	-1.2	96	76	-0.040	1.86	0.10
152	22.324	0.149	2.24	99	-2.54	98	77	-0.030	2.69	0.04
153	22.474	0.150	2.24	98	-2.35	100	77	-0.050	1.40	0.08
154	22.621	0.147	2.22	98	-0.9	97	77	-0.030	2.11	0.06
155	22.772	0.151	2.24	99	-1.03	104	77	-0.040	1.61	0.09
156	22.919	0.147	2.24	99	-1.31	100	76	-0.040	2.42	0.08
157	23.070	0.151	2.23	99	-0.8	100	76	-0.040	1.45	0.10
158	23.217	0.147	2.23	99	-2.1	100	76	-0.040	2.16	0.05
159	23.370	0.153	2.24	99	-2.12	104	75	-0.030	1.93	0.09

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	23.516	0.146	2.24	99	-0.94	102	75	-0.040	1.80	0.07
161	23.668	0.152	2.24	99	-2.48	106	75	-0.050	2.13	0.06
162	23.815	0.147	2.24	99	-2.35	97	76	-0.030	1.84	0.08
163	23.965	0.150	2.24	99	-2.42	103	77	-0.050	1.64	0.10
164	24.113	0.148	2.24	99	-1.67	95	77	-0.030	1.94	0.05
165	24.263	0.150	2.24	99	-2.12	103	77	-0.030	2.11	0.05
166	24.411	0.148	2.23	99	-2.53	100	77	-0.030	1.71	0.10
167	24.561	0.150	2.24	99	-1.93	99	76	-0.030	2.45	0.11
168	24.710	0.149	2.22	99	-1.25	98	76	-0.030	1.35	0.08
169	24.860	0.150	2.23	99	-0.83	94	76	-0.050	1.96	0.11
170	25.009	0.149	2.23	99	-2.23	95	75	-0.040	1.92	0.06
171	25.158	0.149	2.24	99	-1.07	104	75	-0.040	2.20	0.08
172	25.308	0.150	2.23	99	-2.02	101	75	-0.040	2.33	0.11
173	25.455	0.147	2.22	99	-1.08	98	75	-0.020	1.52	0.09
174	25.606	0.151	2.23	99	-2.49	97	75	-0.040	1.90	0.03
175	25.752	0.146	2.23	99	-1.05	99	76	-0.030	1.91	0.04
176	25.904	0.152	2.22	99	-2.07	101	77	-0.040	1.80	0.05
177	26.051	0.147	2.24	99	-2.34	100	77	-0.020	1.96	0.08
178	26.203	0.152	2.22	99	-2.5	107	77	-0.040	1.85	0.08
179	26.349	0.146	2.22	99	-1.66	97	76	-0.040	2.03	0.07
180	26.501	0.152	2.22	99	-2.48	106	76	-0.030	1.21	0.09
181	26.648	0.147	2.24	99	-2.26	95	76	-0.030	1.91	0.03
182	26.799	0.151	2.23	99	-1.96	99	75	-0.030	1.73	0.06
183	26.945	0.146	2.24	99	-1.51	100	75	-0.040	1.90	0.08
184	27.096	0.151	2.24	99	-2.47	103	75	-0.030	1.94	0.05
185	27.243	0.147	2.23	99	-0.81	94	75	-0.030	2.00	0.11
186	27.393	0.150	2.22	99	-2.49	99	75	-0.010	1.38	0.10
187	27.542	0.149	2.22	99	-1.91	95	76	-0.030	2.62	0.04
188	27.692	0.150	2.21	99	-2.47	106	77	-0.040	2.28	0.04
189	27.841	0.149	2.23	99	-0.83	104	77	-0.050	1.55	0.07
190	27.989	0.148	2.22	99	-2.47	103	77	-0.030	2.11	0.09
191	28.140	0.151	2.24	99	-1.85	102	77	-0.040	1.92	0.04

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	28.287	0.147	2.23	100	-1.72	95	76	-0.040	1.35	0.07
193	28.437	0.150	2.23	99	-2.09	108	76	-0.010	2.20	0.07
194	28.584	0.147	2.22	99	-1.08	99	76	-0.050	2.20	0.09
195	28.735	0.151	2.22	99	-2.49	104	75	-0.050	1.47	0.07
196	28.881	0.146	2.23	100	-2.16	93	75	-0.030	1.86	0.09
197	29.032	0.151	2.22	99	-2.1	95	75	-0.040	1.68	0.08
198	29.179	0.147	2.21	99	-1.91	97	75	-0.030	2.09	0.09
199	29.331	0.152	2.22	100	-2.26	105	75	-0.020	1.68	0.05
200	29.477	0.146	2.22	100	-2.48	93	77	-0.030	1.88	0.07
201	29.629	0.152	2.22	100	-1.32	103	77	-0.040	1.43	0.05
202	29.776	0.147	2.23	100	-1.48	97	77	-0.030	1.88	0.04
203	29.926	0.150	2.22	100	-1.75	109	76	-0.040	1.54	0.07
204	30.072	0.146	2.22	100	-2.49	104	76	-0.030	1.61	0.05
205	30.223	0.151	2.22	100	-2.51	100	76	-0.020	2.07	0.04
206	30.370	0.147	2.22	100	-2.37	100	76	-0.030	2.27	0.05
207	30.520	0.150	2.22	100	-2.02	103	75	-0.030	1.89	0.04
208	30.668	0.148	2.21	100	-1.46	102	75	-0.030	1.89	0.06
209	30.818	0.150	2.22	100	-0.84	102	75	-0.040	2.25	0.06
210	30.967	0.149	2.21	100	-2.52	102	75	-0.040	1.69	0.06
211	31.116	0.149	2.21	100	-1.91	96	76	-0.030	1.91	0.08
212	31.265	0.149	2.21	100	-1.83	95	77	-0.020	1.97	0.04
213	31.413	0.148	2.21	100	-0.9	106	77	-0.030	2.24	0.07
214	31.563	0.150	2.21	100	-0.85	103	77	-0.030	2.03	0.07
215	31.709	0.146	2.21	100	-2.28	100	76	-0.040	1.67	0.05
216	31.859	0.150	2.21	100	-1.2	100	76	-0.030	1.75	0.01
217	32.006	0.147	2.22	100	-1.37	105	76	-0.040	1.68	0.07
218	32.156	0.150	2.21	100	-2.55	103	76	-0.040	2.41	0.09
219	32.303	0.147	2.20	100	-1.15	94	75	-0.020	2.22	0.06
220	32.454	0.151	2.20	100	-0.96	102	75	-0.040	2.05	0.08
221	32.605	0.151	2.21	100	-1.25	99	75	-0.030	2.32	0.03
222	32.756	0.151	2.21	100	-1.03	100	75	-0.030	2.06	0.04
223	32.903	0.147	2.21	100	-2.51	99	75	-0.040	1.90	0.08

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	33.054	0.151	2.20	100	-1.97	101	76	-0.040	1.73	0.10
225	33.200	0.146	2.20	100	-2.31	100	77	-0.030	1.79	0.02
226	33.351	0.151	2.22	100	-1.65	96	77	-0.040	1.90	0.06
227	33.497	0.146	2.21	100	-2.37	95	77	-0.030	1.74	0.05
228	33.647	0.150	2.20	100	-1.33	102	76	-0.020	1.03	0.07
229	33.793	0.146	2.20	100	-0.95	97	76	-0.030	2.12	0.07
230	33.944	0.151	2.21	100	-0.91	111	76	-0.040	2.06	0.07
231	34.090	0.146	2.21	100	-0.85	96	76	-0.030	1.41	0.05
232	34.240	0.150	2.21	100	-2.54	101	76	-0.040	1.72	0.08
233	34.388	0.148	2.21	100	-1.08	109	75	-0.040	1.43	0.06
234	34.538	0.150	2.20	100	-2.42	94	75	-0.040	2.07	0.05
235	34.686	0.148	2.20	100	-2.54	96	75	-0.030	2.38	0.04
236	34.835	0.149	2.20	100	-1.39	101	75	-0.030	2.22	0.02
237	34.983	0.148	2.20	100	-2.45	94	75	-0.030	1.99	0.04
238	35.131	0.148	2.17	100	-2.22	98	77	-0.030	1.83	0.00
239	35.281	0.150	2.22	100	-1.94	104	77	-0.040	2.07	0.04
240	35.428	0.147	2.21	100	-1.63	102	77	-0.030	2.36	0.05
241	35.577	0.149	2.21	100	-1.95	110	77	-0.040	1.38	0.06
242	35.724	0.147	2.20	100	-1.05	98	76	-0.040	1.91	0.03
243	35.875	0.151	2.20	100	-1.44	108	76	-0.040	2.23	0.07
244	36.021	0.146	2.20	100	-1.8	94	76	-0.030	2.04	0.10
245	36.171	0.150	2.20	100	-1.87	104	76	-0.030	2.29	0.11
246	36.317	0.146	2.19	100	-1.57	93	75	-0.030	1.45	0.07
247	36.468	0.151	2.20	100	-2.49	99	75	-0.020	1.92	0.05
248	36.614	0.146	2.19	100	-1.91	94	75	-0.020	2.51	0.04
249	36.765	0.151	2.20	100	-1.12	94	75	-0.040	1.62	0.06
250	36.911	0.146	2.19	100	-1.93	96	75	-0.030	2.48	0.03
251	37.061	0.150	2.20	100	-1.09	104	75	-0.030	1.85	0.04
252	37.207	0.146	2.18	100	-1.97	93	75	-0.040	1.77	0.03
253	37.358	0.151	2.21	100	-2.18	106	76	-0.040	2.06	0.07
254	37.504	0.146	2.19	100	-0.93	95	77	-0.030	1.96	0.03
255	37.654	0.150	2.19	100	-1.24	107	77	-0.030	2.68	0.09

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	37.800	0.146	2.20	100	-1.38	98	77	-0.030	2.15	0.03
257	37.949	0.149	2.20	100	-1.4	108	76	-0.030	1.88	0.08
258	38.096	0.147	2.20	101	-2.4	98	76	-0.040	2.13	0.05
259	38.246	0.150	2.19	100	-2.53	99	76	-0.040	2.31	0.04
260	38.392	0.146	2.19	100	-1.68	99	76	-0.030	1.91	0.05
261	38.541	0.149	2.19	100	-0.93	97	75	-0.030	1.50	0.07
262	38.689	0.148	2.19	100	-0.97	94	75	-0.040	2.02	0.06
263	38.838	0.149	2.19	100	-0.97	101	75	-0.030	2.16	0.06
264	38.986	0.148	2.18	101	-1.51	94	75	-0.040	1.77	0.03
265	39.135	0.149	2.19	101	-2.58	102	75	-0.030	2.20	0.02
266	39.283	0.148	2.19	101	-2.16	99	76	-0.020	1.68	0.07
267	39.431	0.148	2.19	101	-1.12	101	77	-0.030	1.60	0.04
268	39.580	0.149	2.18	101	-2.58	99	77	-0.030	2.45	0.05
269	39.727	0.147	2.21	101	-2.57	100	77	-0.030	1.80	0.07
270	39.876	0.149	2.19	101	-2.2	97	76	-0.040	1.48	0.06
271	40.023	0.147	2.20	101	-0.87	101	76	-0.040	1.74	0.04
272	40.172	0.149	2.20	101	-2.69	105	76	-0.030	2.07	0.06
273	40.318	0.146	2.18	100	-1.99	96	76	-0.040	1.62	0.05
274	40.468	0.150	2.20	101	-2.59	107	76	-0.030	2.14	0.03
275	40.614	0.146	2.19	101	-1.24	100	75	-0.040	1.99	0.04
276	40.764	0.150	2.19	101	-2.67	103	75	-0.040	2.32	0.06
277	40.910	0.146	2.19	101	-2.61	101	75	-0.040	1.98	0.07
278	41.060	0.150	2.18	101	-0.94	95	75	-0.040	2.32	0.06
279	41.206	0.146	2.17	101	-2.51	93	75	-0.030	2.09	0.07
280	41.357	0.151	2.19	101	-2.15	107	76	-0.030	2.19	0.08
281	41.502	0.145	2.18	101	-2.27	96	77	-0.040	2.09	0.05
282	41.653	0.151	2.18	101	-2.61	105	77	-0.040	1.40	0.04
283	41.798	0.145	2.18	101	-1.2	101	77	-0.040	2.03	0.05
284	41.948	0.150	2.18	101	-2.56	104	77	-0.030	2.70	0.09
285	42.094	0.146	2.18	101	-1.77	98	77	-0.030	1.73	0.04
286	42.244	0.150	2.17	101	-0.92	98	76	-0.040	1.83	0.07
287	42.390	0.146	2.20	101	-2.11	97	76	-0.030	1.79	0.05

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	42.540	0.150	2.17	101	-2.66	98	76	-0.030	1.80	0.06
289	42.685	0.145	2.20	101	-2.68	98	76	-0.040	1.98	0.09
290	42.835	0.150	2.19	101	-2.35	108	76	-0.030	1.98	0.04
291	42.980	0.145	2.19	101	-2.55	101	75	-0.040	2.34	0.05
292	43.130	0.150	2.17	101	-2.59	103	75	-0.040	1.53	0.05
293	43.276	0.146	2.19	101	-2.17	99	75	-0.030	1.36	0.09
294	43.426	0.150	2.18	101	-2.69	104	75	-0.030	1.86	0.06
295	43.572	0.146	2.18	101	-1.51	103	76	-0.030	2.04	0.04
296	43.721	0.149	2.19	101	-0.97	99	77	-0.040	1.62	0.07
297	43.867	0.146	2.18	101	-0.96	99	77	-0.020	1.86	0.05
298	44.016	0.149	2.16	101	-1.81	97	77	-0.020	1.92	0.05
299	44.163	0.147	2.17	101	-2.51	104	77	-0.050	2.44	0.06
300	44.312	0.149	2.17	101	-2.62	102	76	-0.030	1.83	0.05
301	44.459	0.147	2.18	101	-2.48	100	76	-0.040	1.78	0.08
302	44.607	0.148	2.17	101	-1.42	95	76	-0.030	2.10	0.02
303	44.755	0.148	2.18	101	-1.54	98	76	-0.040	1.49	0.07
304	44.903	0.148	2.18	101	-2.1	103	76	-0.020	1.91	0.06
305	45.050	0.147	2.16	101	-2.16	105	75	-0.040	2.18	0.03
306	45.198	0.148	2.18	101	-2.37	94	75	-0.040	1.26	0.07
307	45.346	0.148	2.17	101	-1.9	102	75	-0.030	1.36	0.05
308	45.493	0.147	2.16	101	-1.22	99	75	-0.040	2.47	0.04
309	45.642	0.149	2.18	101	-0.91	102	77	-0.030	2.06	0.02
310	45.788	0.146	2.17	101	-1.92	102	77	-0.030	1.45	0.08
311	45.937	0.149	2.18	101	-1.85	102	77	-0.030	2.46	0.06
312	46.083	0.146	2.18	101	-2.58	96	77	-0.040	2.24	0.07
313	46.231	0.148	2.18	101	-1.16	97	77	-0.030	1.76	0.05
314	46.377	0.146	2.19	101	-2.43	103	76	-0.040	1.91	0.03
315	46.526	0.149	2.17	101	-1.32	97	76	-0.030	1.99	0.05
316	46.672	0.146	2.17	101	-2.51	101	76	-0.040	1.93	0.05
317	46.822	0.150	2.18	101	-2.06	98	76	-0.030	2.04	0.07
318	46.967	0.145	2.17	101	-2.44	99	76	-0.030	2.30	0.03
319	47.116	0.149	2.17	101	-1.9	108	75	-0.040	1.43	0.06

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	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	47.262	0.146	2.19	101	-1.76	96	75	-0.040	2.40	0.06
321	47.411	0.149	2.17	101	-2.63	103	75	-0.030	2.33	0.07
322	47.556	0.145	2.16	101	-2.44	92	76	-0.030	1.83	0.03
323	47.706	0.150	2.17	101	-2.31	102	77	-0.040	1.63	0.06
324	47.851	0.145	2.16	101	-2.66	97	77	-0.050	2.21	0.03
325	48.001	0.150	2.17	101	-1.98	107	77	-0.040	2.11	0.06
326	48.147	0.146	2.17	101	-2.47	94	77	-0.040	1.90	0.02
327	48.296	0.149	2.15	101	-2.53	97	76	-0.040	2.13	0.05
328	48.441	0.145	2.16	101	-2.24	96	76	-0.050	1.80	0.05
329	48.591	0.150	2.16	101	-1.41	96	76	-0.040	1.77	0.05
330	48.736	0.145	2.16	101	-2.43	94	76	-0.020	1.86	0.03
331	48.886	0.150	2.16	101	-2.74	105	76	-0.030	1.85	0.02
332	49.031	0.145	2.16	101	-1.07	95	75	-0.040	1.67	0.07
333	49.181	0.150	2.16	101	-1.5	110	75	-0.030	2.09	0.05
334	49.326	0.145	2.16	101	-2.52	100	75	-0.030	1.93	0.02
335	49.476	0.150	2.15	101	-1.73	96	75	-0.040	1.82	0.04
336	49.621	0.145	2.16	101	-1.92	96	76	-0.040	2.62	0.06
337	49.770	0.149	2.15	101	-2.68	105	77	-0.030	2.19	0.06
338	49.916	0.146	2.14	101	-1.04	100	77	-0.030	1.58	0.06
339	50.065	0.149	2.17	101	-1.34	97	77	-0.030	1.98	0.03
340	50.210	0.145	2.18	101	-0.99	100	77	-0.030	1.76	0.03
341	50.359	0.149	2.15	101	-1.28	102	77	-0.030	1.30	0.07
342	50.504	0.145	2.17	101	-2.24	97	76	-0.020	1.74	0.04
343	50.654	0.150	2.17	101	-1.02	101	76	-0.040	2.55	0.08
344	50.798	0.144	2.17	101	-2.33	93	76	-0.030	2.17	0.06
345	50.947	0.149	2.16	101	-1.06	101	76	-0.030	1.93	0.06
346	51.092	0.145	2.17	101	-1.11	93	75	-0.030	1.52	0.03
347	51.241	0.149	2.15	101	-2.31	103	75	-0.040	2.25	0.03
348	51.386	0.145	2.17	101	-2.23	97	75	-0.040	2.40	0.06
349	51.535	0.149	2.18	101	-2.24	100	75	-0.030	2.13	0.05
350	51.680	0.145	2.16	101	-2.62	97	75	-0.040	2.14	0.01
351	51.829	0.149	2.15	101	-2.18	96	77	-0.030	1.86	0.04

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	51.974	0.145	2.14	101	-2.71	103	77	-0.030	1.61	0.03
353	52.124	0.150	2.16	101	-2.61	105	77	-0.040	1.57	0.05
354	52.269	0.145	2.17	101	-1.01	97	77	-0.040	2.50	0.06
355	52.418	0.149	2.18	101	-2.72	99	77	-0.030	2.04	0.00
356	52.563	0.145	2.16	101	-2.05	91	76	-0.030	2.08	0.04
357	52.712	0.149	2.16	101	-2.59	102	76	-0.030	2.01	0.03
358	52.857	0.145	2.16	101	-1.13	103	76	-0.020	2.06	0.06
359	53.006	0.149	2.16	101	-2.28	94	76	-0.040	1.56	0.06
360	53.151	0.145	2.16	101	-1.44	96	76	-0.040	2.08	0.07
Avg/Tot	53.151	0.148	2.19	96	-1.79	100			2.60	0.07

LAB SAMPLE DATA - ASTM E2515

Client: US Stove Company
Model: 6041
Run #: 1

Job #: 19-495
Tracking #: 028
Technician: SJB
Date: 7/17/2019

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	3525	120.4	120.4	120.7	0.3
Train A Filters - Remainder	3526	120.9	241.0	244.9	3.9
	3527	120.1			
Train A Probe	7A	116741.2	116741.2	116741.4	0.2
Train A O-Rings	7A	3570.1	3570.1	3572.4	2.3
Train B Filters	3528	119.9	240.3	244.5	4.2
	3529	120.4			
Train B Probe	7B	117289.0	117289.0	117289.3	0.3
Train B O-Rings	7B	3519.0	3519.0	3521.3	2.3
Background Filter	3530	120.0	120.0	120.1	0.1

Placed in Dessicator on:	7/17 - 15:30

Train A Filters - First Hour	120.7	7/19 8:00	120.7	7/19 16:18				
Train A Filters - Remainder	245.0	7/19 8:00	244.9	7/19 16:18				
Train A Probe	116741.3	7/19 8:00	116741.4	7/20 16:18				
Train A O-Rings	3572.4	7/19 8:00	3572.4	7/19 16:18				
Train B Filters	244.6	7/19 8:00	244.5	7/19 16:18				
Train B Probe	117289.3	7/19 8:00	117289.3	7/19 16:18				
Train B O-Rings	3521.2	7/19 8:00	3521.3	7/19 16:19				
Background Filter	120.2	7/19 8:00	120.1	7/19 16:19				

1st hour Sub-Total, mg:	0.3
Remainder Sub-Total, mg:	6.4
Train 1 Aggregate, mg:	**6.7**
Train 2 Aggregate, mg:	**6.8**
Ambient Aggregate, mg:	0.1

ASTM E2779 Pellet Heater Run Sheets

Client: US Stove Company Job Number: 19-495 Tracking #: 028
Model: 6041 Run Number: 1 Test Date: 7/17/2019

Pellet Heater Control Settings

High Burn Rate Settings: PR-5

Medium Burn Rate Settings: PR-1

Low Burn Rate Settings: PR-1

Preburn Notes

Preburn Start Time: 8:08

Time	Notes
N/A	N/A

Test Notes

Test Burn Start Time: 9:08

Time	Notes
60 min 360 min	Changed 1-hour filter turned down to medium/low burn rate setting. End of Test

Test Burn End Time: 15:08

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 17.00 CO (%): 4.31

Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:16	8:20	8:19	15:31	15:33	15:34
CO_2	0.00	10.08	17.00	0.00	10.18	17.23
CO	0.00	2.491	4.31	0.009	2.516	4.348

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

Technician Signature: Date: 7/17/2019

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

Analytical Test Report

Report No: USR:W218-0155-01
Issue No: 1

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

PO No: S. Button

Signed:

Stephen Sundeen
Chemistry Laboratory Manager

Date of Issue: 2/27/2018

Sample Details

Sample Log No:	W218-0155-01	**Sample Date:**	
Sample Designation:	Presto Log - Pure Western Conife	**Sample Time:**	
Sample Recognized As:	Wood Pellets	**Arrival Date:**	2/15/2018

Test Results

	METHOD	UNITS	MOISTURE FREE	AS RECEIVED
Moisture Total	ASTM E871	wt. %		3.03
Ash	ASTM D1102	wt. %	0.20	0.19
Volatile Matter	ASTM D3175	wt. %		
Fixed Carbon by Difference	ASTM D3172	wt. %		
Sulfur	ASTM D4239	wt. %	0.006	0.006
SO_2	Calculated	lb/mmbtu		0.013
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	19.07	18.42
Net Cal. Value at Const. Pressure	ISO 1928	J/g	19075	18424
Gross Cal. Value at Const. Vol.	ASTM E711	J/g	20397	19780
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8770	8504
Carbon	ASTM D5373	wt. %	50.57	49.04
Hydrogen*	ASTM D5373	wt. %	6.08	5.89
Nitrogen	ASTM D5373	wt. %	< 0.20	< 0.19
Oxygen*	ASTM D3176	wt. %	> 42.95	> 41.65
Chlorine	ASTM D6721	mg/kg		
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft^3		
Fines (Less than 1/8")	TPT CH-P-06	wt.%		
Durability Index	Kansas State	PDI		
Sample Above 1.50"	TPT CH-P-06	wt.%		
Maximum Length (Single Pellet)	TPT CH-P-06	inch		
Diameter, Range	TPT CH-P-05	inch		to
Diameter, Average	TPT CH-P-05	inch		
Stated Bag Weight	TPT CH-P-01	lbs		
Actual Bag Weight	TPT CH-P-01	lbs		

*Note: As received values do not include hydrogen and oxygen in the total moisture.

Comments

Sample Pre-Test Tare Sheet: ☐ Probes ☒ Filters ☐ O-Rings

Date/Time In Desiccator: 5/3/19 - 15:00 Balance ID#: 107 Audit Weight ID# / Weight(mg): 109A-100mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
3511	5/9/19	120.4	5/10/19	120.3					A	19-475 #4
3512		119.3		119.3					A	↓
3513		119.9		119.9					A	19-475 #5
3514		118.8		118.8					A	↓
3515		119.4		119.5					A	
3516		119.1		119.3					A	
3517		120.1		120.0					A	
3518		119.9		119.9					A	
3519		119.8		119.9					A	19-475 #6
3520		119.7		119.3					A	↓
3521		119.4		119.6					A	
3522		120.0		120.0					A	
3523		118.8		118.8					A	
3524		119.6		119.6					A	
3525	7/16 - 16:00	120.5	7/17 - 8:30	120.4					SB	19-495 #1
3526		120.3		120.9					SB	↓
3527		120.1		120.1					SB	
3528		~~12~~ 119.8		119.9					SB	
3529		120.3		120.4					SB	
3530		120.0		120.0					SB	
3531		120.2		120.2					SB	-
3532		119.2		119.2					SB	
3533										
3534										
3535										
3536										
3537										
3538										
3539										
3540										

ASTM E2515 - Probes

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
1A	115630.0	115630.2	–	–	SB	18-449	#1
1B	115903.7	115903.8	–	–	SB		
2A	116240.5	116240.5	–	–	SB	18-449	#2
2B	116330.5	116330.6	–	–	SB		
3A	116078.1	116078.1	–	–	SB	18-449	#3
3B	116340.8	116340.9	–	–	SB		
4A	116183.6	116183.8	–	–	SB	19-480	#1
4B	116365.8	116366.0	–	–	SB		
5A	116769.1	116769.7	116769.1	116769.3	SB	19-480	#2
5B	116876.8	116877.2	116876.8	116876.9	SB		

Weight 1 Date/Time:
6/10 - 7:00

Weight 2 Date/Time:
6/11 - 7:45

Weight 3 Date/Time:
6/13 - 8:30

Weight 4 Date/Time:
6/14 - 7:30

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
6A	116544.8	116545.5	116545.3	–	SB	19-480	#3
6B	116117.9	116118.4	116118.4	–	SB		
7A	116740.8	116741.1	116741.2	–	SB	19-495	#1
7B	117289.4	117289.1	117289.0	–	SB	↓	↓
8A	116823.4	116824.4	116824.3	–	SB	19-496	#1
8B	116825.8	116826.3	116826.2	–	SB	↓	#1
9A	116714.4	116714.2	–	–	SB	19-496	#2
9B	117920.6	117920.1	117920.3	–	SB	↓	#2
10A	116820.7	116820.5	–	–	SB	19-496	#3
10B	117905.3	117905.2	–	–	SB	↓	#3

Weight 1 Date/Time:
6/13 - 8:30

Weight 2 Date/Time:
6/14 - 7:30

Weight 3 Date/Time:
6/17 - 7:00

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A	117035.5	117035.7	–	–	SB		
11B	117489.9	117489.9	–	–	SB		
12A	116889.3	116889.1	–	–	SB		
12B	117957.1	117957.2	–	–	SB		
13A	117456.0	117455.8	–	–	SB		
13B	117054.7	117054.9	–	–	SB		
14A	116818.1	116817.8	116817.7	–	SB		
14B	116772.0	116771.7	116771.5	–	SB		
15A	117418.9	117418.8	–	–	SB		
15B	116905.2	116905.3	–	–	SB		

Weight 1 Date/Time:
7/22 ~ 7:00

Weight 2 Date/Time:
7/23 - 8:00

Weight 3 Date/Time:
7/24 - 8:00

Weight 4 Date/Time:

ASTM E2515 - O-Rings

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
1A	3562.7	3562.8	-	-	SB	18-449	#1
1B	3551.3	3551.3	-	-	SB		
2A	3548.4	3548.5	-	-	SB	18-449	#2
2B	3566.9	3567.1	-	-	SB		
3A	3575.6	3575.7	-	-	SB	18-449	#3
3B	3564.0	3564.2	-	-	SB		
4A	3588.4	3588.5	-	-	SB	19-480	#1
4B	3576.1	3576.3	-	-	SB		
5A	3530.2	3530.2	-	-	SB	19-480	#2
5B	3526.8	3526.9	-	-	SB		

Weight 1 Date/Time:
6/10 - 7:00

Weight 2 Date/Time:
6/11 - 7:45

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
6A	3611.1	3611.2	-	-	SB	19-480	#3
6B	3387.9	3387.8	-	-	SB		
7A	3570.0	3570.1	-	-	SB	19-495	#1
7B	3518.8	3519.0	-	-	SB		
8A	3548.8	3549.0	-	-	SB	19-496	#1
8B	3582.2	3582.3	-	-	SB		
9A	3579.9	3580.1	-	-	SB	19-496	#2
9B	3522.5	3522.7	-	-	SB		
10A	3427.7	3427.9	-	-	SB	19-496	#3
10B	3568.4	3568.6	-	-	SB		

Weight 1 Date/Time:
6/10 - 7:00

Weight 2 Date/Time:
6/13 - 8:30

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A	3421.6	3422.2	3422.3	-	SB		
11B	4232.2	4232.8	4232.8	-	SB		
12A	3393.9	3394.0	-	-	SB		
12B	3403.9	3404.1	-	-	SB		
13A	3358.8	3359.0	-	-	SB		
13B	3443.2	3443.6	3443.6	-	SB		
14A	3364.1	3364.2	-	-	SB		
14B	3338.3	3338.5	-	-	SB		
15A	3567.9	3568.1	-	-	SB		
15B	3568.3	3568.7	3568.8	-	SB		

Weight 1 Date/Time:
7/22 - 7:15

Weight 2 Date/Time:
7/24 - 8:00

Weight 3 Date/Time:
7/25 - 7:00

Weight 4 Date/Time:

Equations and Sample Calculations – ASTM E2779 & E2515

Client	US Stove Company
Model:	6041
Tracking #:	028
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_{Bdb} – Weight of test fuel burned during test run, dry basis, kg

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

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

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

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

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

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

m_n – Total Particulate Matter Collected, mg

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

E_T – Total Particulate Emissions, g

PR - Proportional Rate Variation

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

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

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

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

Where,

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

Sample Calculation:

FM =	3.12	%
M_{Swb} =	12.5	lbs
M_{Ewb} =	0.0	lbs
0.4536 =	Conversion factor from lbs to kg	

M_{Bdb} = [(12.5 x 0.4536) - (0.0 x 0.4536)] (100/(100 + 3.12)

M_{Bdb} = **5.5** kg

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

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

Where,

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

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

Sample Calculation (from medium burn rate segment):

FM = 3.12 %

M_{SSiwb} = 8.7 lbs

M_{ESiwb} = 5.1 lbs

0.4536 = Conversion factor from lbs to kg

M_{BSidb} = [(8.7 x 0.4536) - (5.1 x 0.4536)] (100/(100 + 3)

M_{BSidb} = **1.58** kg

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

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

Where,

θ = Total length of full integrated test run, min

Sample Calculation:

M_{Bdb} = 5.50 kg
θ = 360 min

$$BR = \frac{60 \times 5.5}{360}$$

BR = **0.92** kg/hr

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

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

Where,

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

Sample Calculation (from medium burn rate segment):

M_{BSidb} = 1.58 kg
θ = 120 min

$$BR = \frac{60 \times 1.58}{120}$$

BR = **0.79** kg/hr

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

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

Where:

F_p = Adjustment factor for center of tunnel pitot tube placement, Fp = $\frac{V_{strav}}{V_{scent}}$, ASTM E2515 Equation (1)

v_{scent} = Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec

v_{strav} = Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec

k_p = Pitot tube constant, 85.49

C_p = Pitot tube coefficient: 0.99, unitless

ΔP* = Velocity pressure in the dilution tunnel, in H_2O

T_s = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)

P_s = Absolute average gas static pressure in dilution tunnel, = $P_{bar} + P_g$, in Hg

P_{bar} = Barometric pressure at test site, in. Hg

P_g = Static pressure of tunnel, in. H_20; (in Hg = in H_20/13.6)

M_s = **The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{15.08}{17.22} = 0.876$$

$$V_s = 0.876 \times 85.49 \times 0.99 \times 0.253 \times \left(\frac{107.5 + 460}{\left(29.88 + \frac{-0.17}{13.6}\right) \times 28.78} \right)^{1/2}$$

V_s = **15.24** ft/s

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

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

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

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

Where:

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

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 15.24 \times 0.1963 \times \frac{528}{107.5 + 460} \times \frac{29.88 + \frac{-0.17}{13.6}}{29.92}$$

Q_{sd} = **9803.8** dscf/hr

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

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

Where:

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

Sample Calculation:

Using equation for Train A:

$$V_{m(std)} = 17.64 \times 53.610 \times 0.999 \times \frac{\left(29.88 + \frac{2.21}{13.6}\right)}{(82.9 + 460)}$$

$V_{m(std)}$ = **52.277** dscf

Using equation for Train B:

$$V_{m(std)} = 17.64 \times 53.151 \times 0.996 \times \frac{\left(29.88 + \frac{2.19}{13.6}\right)}{(96.4 + 460)}$$

$V_{m(std)}$ = **50.416** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 70.05 \times 0.992 \times \frac{\left(\underline{29.88} + \frac{0.00}{13.6}\right)}{(75.8 + 460)}$$

$V_{m(std)}$ = **68.356** 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 + 0.3 + 0.0

m_n = 0.3 mg

Using equation for Train A (remainder):

m_n = 0.2 + 3.9 + 2.3

m_n = 6.4 mg

Train A Aggregate = **6.7** mg

Using equation for Train B:

m_n = 0.3 + 4.2 + 2.3

m_n = **6.8** mg

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

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

Where:

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

Sample calculation:

For Train A:

$$C_s = 0.001 \times \frac{6.7}{52.28}$$

C_s = **0.00013** g/dscf

For Train B:

$$C_s = 0.001 \times \frac{6.8}{50.42}$$

C_s = **0.00013** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.1}{68.36}$$

C_r = **0.000001** g/dscf

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

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

Where:

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

Sample calculation:

For Train A

E_T = (0.000128 - 0.000001) x 9803.8 x 360 /60

E_T = 7.45 g

For Train B

E_T = (0.000135 - 0.000001) x 9803.8 x 360 /60

E_T = 7.85 g

Average

E = 7.65 g

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

7.5% of the average =	0.57
Train A difference =	0.20
Train B difference =	0.20

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 A):

$$PR = \left(\frac{360 \times 0.128 \times 15.24 \times (82.9 + 460) \times (\#\#\#\# + 460)}{1 \times 53.61 \times 15.90 \times (107.5 + 460) \times (78.0 + 460)} \right) \times 100$$

PR = 84 %

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

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation:

E_T (Dual train average) = 7.65 g

θ = 360 min

$PM_R = 60 \times (7.65 / 360)$

PM_R = **1.28** g/hr

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

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

Where,

E_T = Total particulate emissions, grams

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

Sample Calculation:

E_T (Dual train average) = 7.65 g

M_{Bdb} = 5.50 kg

PM_F = 7.65 / 5.50)

PM_F = **1.39** g/kg

Appendix B: Labels & Manuals

NOTES:

MATERIAL: 0.012 THK. ALUMINUM / 3M 9672 (or equivalent) ADEHESIVE BACKED.

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

TEXT: ALL TEXT TO BE 0.08 HIGH UNLESS OTHERWISE SPECIFIED

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	4/8/09	CDB
B	ADDED PHONE NUMBER	2/22/11	REC
C	ADDED STANDARD DATE PER OMNI	7/15/13	ALW
D	REVISED PER EPA 2015	4/21/15	CDB
E	ADDED PFS CHANGED TO EPA 2020	7/24/19	SEH
F	CHANGED TO PFS ONLY	2/18/20	SEH
G	REMOVED (UM) HUD	5/20/20	SEH

BOARDER, LOGS, AND FLAMES ARE TO BE RED, 1" sq.

0.25 TEXT HEIGHT

0.125 TEXT HEIGHT

0.1 TEXT HEIGHT

CAUTION: HOT WHILE IN OPERATION-DO NOT TOUCH. KEEP CHILDREN AND CLOTHING AWAY. CONTACT MAY CAUSE SKIN BURNS. SEE NAMEPLATE AND INSTRUCTIONS. KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM THE APPLIANCE. OPERATE THIS UNIT ONLY WITH THE FUEL HOPPER LID CLOSED. FAILURE TO DO SO MAY RESULT IN EMISSION OF PRODUCTS OF HOPPER UNDER CERTAIN CONDITIONS. MAINTAIN HOPPER SEAL IN GOOD CONDITION. DO NOT OVERFILL HOPPER.

PREVENT HOUSE FIRES - Install and use ONLY in accordance with the installation and operating Instructions. Contact local building or fire officials about restrictions and installation inspection in your area. DO NOT connect this unit to a chimney flue serving another appliance. See local building code and manufacturer's instructions for precautions required for passing through a combustible wall or ceiling. Inspect and clean exhaust vent system frequently in accordance with manufacturer's instructions. Keep viewing and ash removal doors tightly closed during operation. Exhaust vent required for residential installation or mobile home installation is a listed type "L" or "PL" venting - 3"/75mm or 4"/100mm diameter.

0.09 TEXT HEIGHT

CAUTION: RISK OF EXCESSIVE TEMPERATURES. HOT OR MOVING PARTS MAY CAUSE INJURY. DO NOT OPERATE WITH SIDE PANELS REMOVED. REPLACE GLASS ONLY WITH 5MM CERAMIC GLASS.

0.125 TEXT HEIGHT

DANGER: RISK OF ELECTRICAL SHOCK. DISCONNECT POWER BEFORE SERVICING UNIT. ROUTE SUPPLY CORD AWAY FROM UNIT.

WARNING: DO NOT INSTALL IN A SLEEPING ROOM. THE STRUCTURAL INTEGRITY OF THE MANUFACTURED HOME'S FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.
START UP: Automatic Ignition - Shut door, Press the "ON" button, Select Heat setting.
SHUT DOWN: Turn the heat setting to "OFF". Unit will shut down automatically after fuel burns out and unit cools down.

0.06 TEXT HEIGHT

MANUFACTURED BY: U.S. STOVE COMPANY - 227 INDUSTRIAL PARK ROAD, P.O. BOX 151, SOUTH PITTSBURG, TN 37380

PFS US

REPORT #: F20-573

MODEL: 6041

Certified to ASTM E1509-12 (2017)
ELECTRICAL RATING: 120V, 15A, 60Hz
INPUT RATING: 32,000 BTU/HR (PELLET FUEL)

THIS PELLET FIRED APPLIANCE HAS BEEN TESTED AND LISTED FOR USE IN MOBILE HOMES.
"FOR USE WITH PELLET FUEL or SHELLED CORN (15% or LESS MOISTURE)"

Environmental Protection Agency
Certified to comply with 2020 particulate emission standards.
Tested to ASTM E2779-10 & ASTM E2515-17 - 1.3 g/hr and a 58% efficiency.

SEE DETAIL

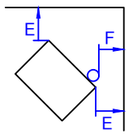
Serial No.

Manufacture Date.

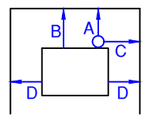
MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS

PARALLEL	A - BACKWALL TO FLUE	3 IN/75MM	
	B - BACKWALL TO UNIT	9 IN/228MM	
	C - SIDEWALL TO FLUE	13 IN/330MM	
	D - SIDEWALL TO TOP EDGE OF UNIT	8 IN/203MM	
CORNER	E - ADJACENT WALL TO UNIT	4 IN/100MM	
	F - ADJACENT WALL TO FLUE	3 IN/75MM	

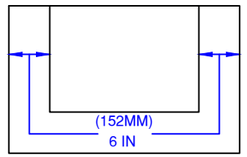
CORNER INSTALL



BACKWALL/SIDEWALL PARALLEL



NONCOMBUSTIBLE FLOOR PROTECTION



A 1" THICK NONCOMBUSTIBLE FLOOR PROTECTOR IS RECOMMENDED FOR THIS INSTALLATION.

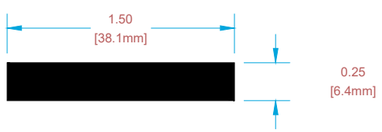
DO NOT REMOVE OR COVER THIS LABEL

851771G

4.63

12.00

SERIAL & DATE BOX DETAIL



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

DESCRIPTION: SEE NOTE
FINISH: SEE NOTE
REFERENCE: 6041

SCALE: 1:1
DWN BY: CDB
DATE: 2/19/09

SIZE: B
REV: G

UNITED STATES STOVE COMPANY
ESTABLISHED 1869

TITLE: LABEL, CERTIFICATION
NUMBER: 851771
SHEET: 1 OF 1

NOTES:

MATERIAL: 0.012 THK. ALUMINUM / 3M 9672 (or equivalent) ADEHESIVE BACKED.

FINISH: BLACK BACKGROUND, SILVER TEXT AND ILLUSTRATIONS UNLESS NOTED OTHERWISE.

TEXT: ALL TEXT TO BE 0.08 HIGH UNLESS OTHERWISE SPECIFIED

HEATER MANUFACTURER INSTRUCTIONS:

ALL PLATES ARE TO BE STAMPED BY THE HEATER MFG. WITH A FACTORY IDENTIFIER NUMBER ISSUED BY USSC. (i.e. 00000-XX)

WHEN LABEL IS APPLIED TO THE HEATER, IT IS TO BE FIRMLY PRESSED OVER THE ENTIRE SURFACE TO ENSURE IT PROPERLY ADHERES TO THE MATING SURFACE OF THE HEATER.

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	4/8/2009	CDB
B	ADDED USSC PHONE NUMBER	2/22/2011	REC
C	REVISED PER EPA RULING 2015	5/12/2015	CDB
D	NEW OMNI LOGO CHANGED "TESTED TO" TO"CERTIFIED TO"	11/28/8	SEH
E	CHANGED TO EPA 2020	7/24/19	SEH
F	CHANGED TO ONLY PFS	1/30/20	SEH
G	REMOVED (UM) HUD	5/20/20	SEH

SEE DETAIL

0.1 TEXT HEIGHT

0.09 TEXT HEIGHT

0.125 TEXT HEIGHT

0.25 TEXT HEIGHT

BOARDER, LOGS, AND FLAMES ARE TO BE RED, 1" sq.

CAUTION: HOT WHILE IN OPERATION-DO NOT TOUCH. KEEP CHILDREN AND CLOTHING AWAY. CONTACT MAY CAUSE SKIN BURNS. SEE NAMEPLATE AND INSTRUCTIONS. KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM THE APPLIANCE. OPERATE THIS UNIT ONLY WITH THE FUEL HOPPER LID CLOSED. FAILURE TO DO SO MAY RESULT IN EMISSION OF PRODUCTS OF HOPPER UNDER CERTAIN CONDITIONS. MAINTAIN HOPPER SEAL IN GOOD CONDITION. DO NOT OVERFILL HOPPER.

MODEL: 6041i

Certified to ASTM E1509-12 (2017)
ELECTRICAL RATING: 120V, 15A, 60Hz
INPUT RATING: 32,000 BTU/HR (PELLET FUEL)

REPORT #: F20-573

THIS PELLET FIRED APPLIANCE HAS BEEN TESTED AND LISTED FOR USE IN MOBILE HOMES.
"FOR USE WITH PELLET FUEL or SHELLED CORN (15% or LESS MOISTURE)"

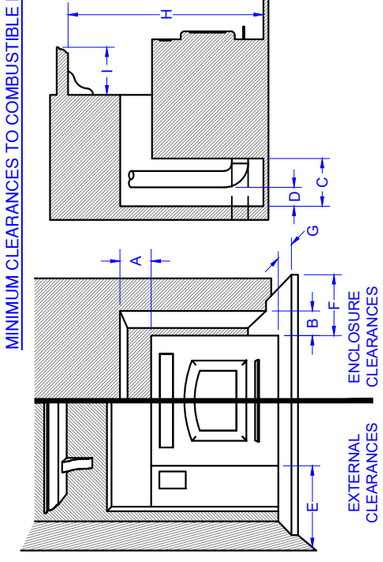
Environmental Protection Agency
Certified to comply with 2020 particulate emission standards.
Tested to ASTM E2779-10 & ASTM E2515-17 - 1.3 g/hr and a 58% efficiency.

Serial No.

Manufacture Date.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS

A	ENCLOSURE UPPER WALL TO UNIT	1"
B	ENCLOSURE SIDEWALL TO UNIT	1"
C	BACKWALL TO UNIT	6"
D	BACKWALL TO FLUE	3"
E	EXTERNAL SIDEWALL TO UNIT	8"
F	FLOOR PROTECTOR TO SIDE TO UNIT	6"
G	FLOOR PROTECTOR TO FRONT OF UNIT	6"
H	FLOOR TO BOTTOM OF MANTEL	53"
I	MANTEL DEPTH	10"



PREVENT HOUSE FIRES - Install and use ONLY in accordance with the installation and operating Instructions. Contact local building or fire officials about restrictions and installation inspection in your area. DO NOT connect this unit to a chimney flue serving another appliance. See local building code and manufacturer's instructions for precautions required for passing through a combustible wall or ceiling. Inspect and clean exhaust vent system frequently in accordance with manufacturer's instructions. Keep viewing and ash removal doors tightly closed during operation. Exhaust vent required for residential installation or mobile home installation is a listed type "L" or "PL" venting - 3"/75mm or 4"/100mm diameter.

CAUTION: RISK OF EXCESSIVE TEMPERATURES. HOT OR MOVING PARTS MAY CAUSE INJURY. DO NOT OPERATE WITH SIDE PANELS REMOVED. REPLACE GLASS ONLY WITH 5MM CERAMIC GLASS.

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This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

START UP: Automatic Ignition - Shut door, Press the "ON" button, Select Heat setting.

SHUT DOWN: Turn the heat setting to "OFF". Unit will shut down automatically after fuel burns out and unit cools down.

DO NOT REMOVE OR COVER THIS LABEL

U.S. STOVE COMPANY • 227 INDUSTRIAL PARK ROAD • SOUTH
PITTSBURG, TN 37380 • Ph. #: (800) 750-2723 • www.USSTOVE.com

851780G

6.00

9.50

0.125 TEXT HEIGHT

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

DESCRIPTION: SEE NOTE
FINISH: SEE NOTE
REFERENCE: 6041 INSERT

SCALE: 1:1
DWN BY: CDB
DATE: 2/19/09

SIZE: B
REV: G

UNITED STATES STOVE COMPANY
ESTABLISHED 1869

TITLE: LABEL, CERTIFICATION
NUMBER: 851780
SHEET: 1 OF 1

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	4/12/2012	CDB
B	REVISED PER EPA RULING 2015	5/13/2015	CDB
C	ADDED PFS CHANGED TO BE EPA 2020	7/23/19	SEH

NOTES:

MATERIAL: 0.012 THK. ALUMINUM / 3M 9672 (or equivalent) ADEHESIVE BACKED.

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

TEXT: ALL TEXT TO BE 0.08 HIGH UNLESS OTHERWISE SPECIFIED

BOARDER, LOGS, AND FLAMES ARE TO BE RED, 1" sq.

0.25 TEXT HEIGHT

0.125 TEXT HEIGHT

CAUTION: HOT WHILE IN OPERATION-DO NOT TOUCH. KEEP CHILDREN AND CLOTHING AWAY. CONTACT MAY CAUSE SKIN BURNS. SEE NAMEPLATE AND INSTRUCTIONS. KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM THE APPLIANCE. OPERATE THIS UNIT ONLY WITH THE FUEL HOPPER LID CLOSED. FAILURE TO DO SO MAY RESULT IN EMISSION OF PRODUCTS OF HOPPER UNDER CERTAIN CONDITIONS. MAINTAIN HOPPER SEAL IN GOOD CONDITION. DO NOT OVERFILL HOPPER.

PREVENT HOUSE FIRES - Install and use ONLY in accordance with the installation and operating Instructions. Contact local building or fire officials about restrictions and installation inspection in your area. DO NOT connect this unit to a chimney flue serving another appliance. See local building code and manufacturer's instructions for precautions required for passing through a combustible wall or ceiling. Inspect and clean exhaust vent system frequently in accordance with manufacturer's instructions. Keep viewing and ash removal doors tightly closed during operation. Exhaust vent required for residential installation or mobile home installation is a listed type "L" or "PL" venting - 3"/75mm or 4"/100mm diameter.

0.09 TEXT HEIGHT

CAUTION: RISK OF EXCESSIVE TEMPERATURES. HOT OR MOVING PARTS MAY CAUSE INJURY. DO NOT OPERATE WITH SIDE PANELS REMOVED. REPLACE GLASS ONLY WITH 5MM CERAMIC GLASS.

0.125 TEXT HEIGHT

DANGER: RISK OF ELECTRICAL SHOCK. DISCONNECT POWER BEFORE SERVICING UNIT. ROUTE SUPPLY CORD AWAY FROM UNIT.

WARNING: DO NOT INSTALL IN A SLEEPING ROOM. THE STRUCTURAL INTEGRITY OF THE MANUFACTURED HOME'S FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.
START UP: Automatic Ignition - Shut door, Press the "ON" button, Select Heat setting.
SHUT DOWN: Turn the heat setting to "OFF". Unit will shut down automatically after fuel burns out and unit cools down.

0.06 TEXT HEIGHT

MANUFACTURED BY: 109 East 17th Street, Suite 5478 • Cheyenne, WY 82001 • Phone: 833-222-3421 • Web: www.acadiahearth.com

REPORT NO. 215-S-01d-2

THIS PELLET FIRED APPLIANCE HAS BEEN TESTED AND LISTED FOR USE IN MOBILE HOMES.
"FOR USE WITH PELLET FUEL or SHELLED CORN (15% or LESS MOISTURE)"

BRECKWELL

MODEL: SP6000

0.1 TEXT HEIGHT

Certified to ASTM E1509, (UM) 84HUD
U.S. Environmental Protection Agency
Certified to comply with 2020 particulate emission standards.
Tested to method ASTM E2779 / Method 28R 1.28 g/hr

PFS US

REPORT NO. 19-495

SEE DETAIL

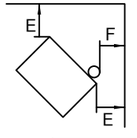
Serial No. | Manufacture Date.

ELECTRICAL RATING: 120V, 15A, 60Hz INPUT RATING: 32,000 BTU/HR (PELLET FUEL)

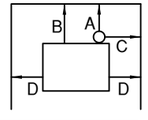
MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS

PARALLEL	A - BACKWALL TO FLUE	3 IN/75MM	
	B - BACKWALL TO UNIT	9 IN/228MM	
	C - SIDEWALL TO FLUE	13 IN/330MM	
	D - SIDEWALL TO TOP EDGE OF UNIT	8 IN/203MM	
CORNER	E - ADJACENT WALL TO UNIT	4 IN/100MM	
	F - ADJACENT WALL TO FLUE	3 IN/75MM	

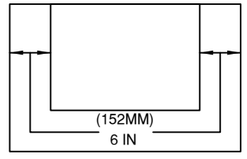
CORNER INSTALL



BACKWALL/SIDEWALL PARALLEL



NONCOMBUSTIBLE FLOOR PROTECTION



A 1" THICK NONCOMBUSTIBLE FLOOR PROTECTOR IS RECOMMENDED FOR THIS INSTALLATION.

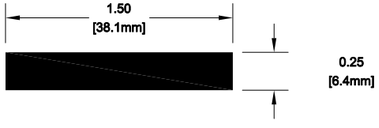
DO NOT REMOVE OR COVER THIS LABEL

851983C

4.63

12.00

SERIAL & DATE BOX DETAIL



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

DESCRIPTION: SEE NOTE
FINISH: SEE NOTE
REFERENCE: SP6000
SCALE: 1:1
DWN BY: CDB
DATE: 4/12/12
SIZE: B
REV: C

UNITED STATES STOVE COMPANY
ESTABLISHED 1869

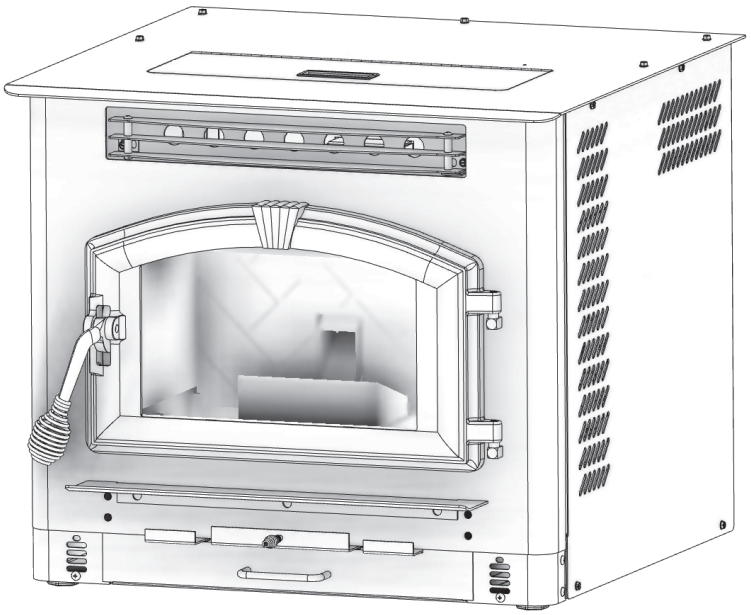
TITLE: LABEL, CERTIFICATION
NUMBER: 851983
SHEET: 1 OF 1

Owner's Instruction and Operation Manual

UNITED STATES STOVE CO.
ESTº 1869

Model Number:
6041i Multi-Fuel Stove

PFS® US
Report Number: F20-573
Tested Per EPA Method ASTM E2779-10
and ASTM E1509-2022



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

851772M-4404M

Save These Instructions In A Safe Place For Future Reference.

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

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

U.S. Environmental Protection Agency
Certified to comply with 2020 particulate emissions standards.

CALIFORNIA PROPOSITION 65 WARNING:
This product can expose you to chemicals including carbon monoxide, which is known to the State of California to cause cancer, birth defects, and/or other reproductive harm. For more information, go to www.P65warnings.ca.gov

THIS MANUAL IS SUBJECT TO CHANGE WITHOUT NOTICE.

SPECIFICATIONS

This manual describes the installation and operation of the United States Stove Company 6041i multi-fuel heater. This heater meets the 2020 U.S. Environmental Protection Agency's pellet fuel 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 7,540 to 21,811 Btu/hr output. This heater achieved a particulate emissions rate of 1.3 g/hr and 58% efficiency when tested to method ASTM E 2779-10. This heater is approved for dual fuel use with dried corn with emissions results of 1.4 g/hr.

Heating Specifications		
Heating Capacity	1,000-2,000 Sq. Ft	* Pellet size may affect the actual rate of fuel feed, burn times, and hopper capacity. Fuel feed rates may vary by as much as 20%. Use PFI listed fuel for best results.
Fuel Storage Capacity *	*up to 60 Lbs.	
Flue Size	3" or 4"	
Electrical Specifications		
Electrical Rating	120 Volts, 60 HZ, 15 Amps	
Dimensions		
Overall: Height x Width X Depth	29" x 24" x 28" (737 mm x 610 mm x 711 mm)	

WARNING:

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

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

You can also register your product online at www.usstove.com/support/product-registration / OR by downloading the US Stove Company app available for iOS and Android.

For Customer Service, please call:

1-800-750-2723 Ext 5050 or;

Text to 423-301-5624 or;

Email us at:

customerservice@usstove.com

INSTALLATION CHECKLIST

Your Wood Stove should be installed by a qualified installer only. An NFI qualified Installer can be found at www.nficertified.org/public/find-an-nfi-pro/

CUSTOMER SERVICE

1-800-750-2723 ext 5050
Text to 423-301-5624
Email to: Customerservice@usstove.com

COMMISSIONING CHECKLIST

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

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

Please Print

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

DESCRIPTION OF WORK

Location of installed appliance: _____

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

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

COMMISSIONING

Confirm Hearth Pad Installation as per Installation Instructions ☐
Confirm proper placement of internal parts ☐
Check soundness of door gasket and door seals ☐
Confirm clearances to combustibles as per installation instructions in this manual ☐
Check the operations of the air controls ☐
Confirm the venting system is secure and sealed ☐
Confirm the stove starts and operates properly ☐
Check to ensure a CO alarm is installed as per local building codes and is functional ☐
Explain the safe operation, proper fuel usage, cleaning, and routine maintenance requirements ☐

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

Signed: _____ Print Name: _____ Date: _____

Home Owner: RETAIN THIS INFORMATION FOR FUTURE REFERENCE

CAUTION:
DISCONNECT THE POWER CORD BEFORE SERVICING THIS HEATER

For the following assemblies, we suggest locating the unit near it's desired location. Depending on installation, you may want to connect the exhaust venting before installing the facade parts.

ASSEMBLY - FACADE (SURROUND)

Remove contents from packaging and make sure you have all components:

(2) Top Facade (a)

(1) Left Side Facade (b)

(1) Right Side Facade (c)

(4 pieces)Facade Trim Kit (d)

(1) Feed Door Spring Handle (e)

(1) Damper Spring Handle (f)

(1) Ash Pan "U" shaped Handle (g)

(1) Access Door Knob (h)

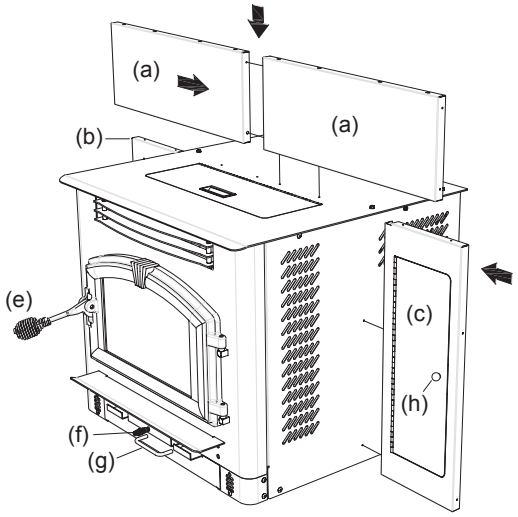
(1) PCB Cover (i)

(1) Panel Cover (j)

(1) Auger (in ash pan)

(1) Power Cord

(1) Burnpot Poker (k)

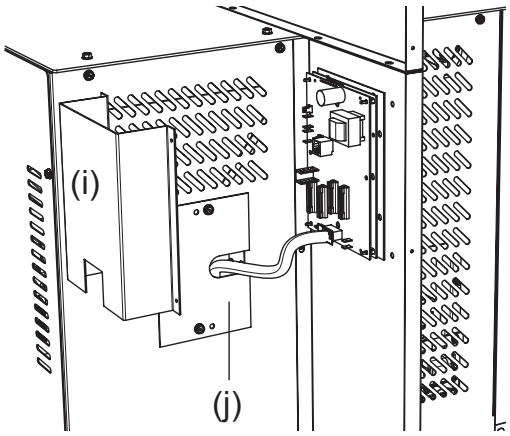


MOUNTING HARDWARE

Start by mounting either the left or right side facade pieces to the unit using four(4) of the supplied #10 x 1/2 screws. Then put the two(2) top facade pieces together with two(2) of the #10 x 1/2 screws provided. Attach the top facade assembly to the unit with eight(8) of the same screws.

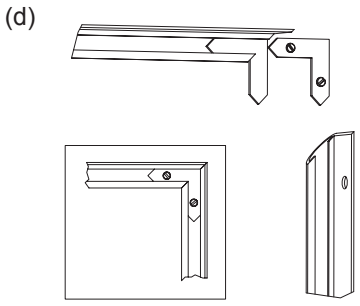
CONTROL BOARD (PCB) RE-LOCATION

Remove the left side front panel from the unit. While holding the PCB with one hand, remove the two(2) hex head screws holding the board in place. It is not necessary to unplug the PCB cable. Route the board and cable through the opening and mount it to the Left Facade using two of the #10 x 1/2 phillips head screws provided. Then attach the PCB cover to the back of the facade covering the board. Next, use the two hex head screws removed earlier and mount the cover panel over the opening where the PCB was located. See illustration to the left.



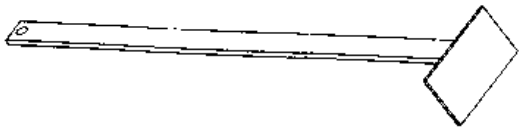
FACADE TRIM

Remove trim from shipping tube. There should be one(1) left side, one(1) right side, two(2) top pieces, and mounting hardware. Using one blank corner key and one corner key with set screws, assemble the left trim and one of the top pieces together. As illustrated, place the blank key behind the key with the set screws. Adjust corners and tighten set screws. Repeat this for the right sideBefore removing tape, place trim assembly against facade to get an idea of how it is to be mounted. Remove the strip from the adhesive and carefully secure the trim in place by firmly pressing it to the facade.



BURNPOT POKER

The burnpot poker may be used several ways. It is used primarily as a fuel-loading assistant to help push the fuel to the rear of the hopper for maximum fueling. It may also be used for cleaning of ashes or removal of clinkers.



INSTALLATION

FOR CUSTOMER SERVICE CALL: 800-750-2723 EXT 5050

SAFETY NOTICE

- **IF THIS STOVE IS NOT PROPERLY INSTALLED, A HOUSE FIRE MAY RESULT. TO REDUCE THE RISK OF FIRE, FOLLOW THE INSTALLATION INSTRUCTIONS.**
- **CONTACT YOUR LOCAL BUILDING OFFICIALS TO OBTAIN A PERMIT AND INFORMATION ON ANY ADDITIONAL INSTALLATION RESTRICTIONS OR INSPECTION REQUIREMENTS IN YOUR AREA.**
- **DO NOT PLACE CLOTHING OR OTHER FLAMMABLE ITEMS ON OR NEAR THIS STOVE.**
- **NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR 'FRESHEN UP' A FIRE IN THIS STOVE. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE STOVE WHILE IT IS IN USE.**
- **DO NOT CONNECT THIS HEATER TO "B" VENT. USE UL LISTED PELL VENT ONLY!**
- **DO NOT ELEVATE THE FIRE BY USE OF GRATE OR ANY OTHER MEANS OTHER THAN THE SUPPLIED BURNPOT.**
- **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.**
- **ALWAYS ROUTE THE POWER CORD AWAY FROM THE UNIT. DO NOT ROUTE CORD IN FOOT TRAFFIC AREAS. DO NOT PINCH CORD UNDER FURNITURE. DO NOT ROUTE THE CORD ACROSS THE EXHAUST PIPE.**
- **A POWER SURGE PROTECTOR IS REQUIRED. THE UNIT MUST BE PLUGGED INTO A GROUNDED 110-VOLT POWER SOURCE.**

CAUTION:

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

ATTENTION:

- **A WORKING SMOKE DETECTOR MUST BE INSTALLED IN THE SAME ROOM AS THIS PRODUCT.**
- **INSTALL A SMOKE DETECTOR ON EACH FLOOR OF YOUR HOME; INCASE OF ACCIDENTAL FIRE FROM ANY CAUSE IT CAN PROVIDE TIME FOR ESCAPE.**
- **THIS HEATER IS NOT INTENDED FOR USE IN COMMERCIAL INSTALLATIONS.**
- **THIS PRODUCT REQUIRES SIMPLE PERIODIC MAINTENANCE FOR PROPER OPERATION AND LONG LIFE OF THE HEATER. READ AND FOLLOW THE MAINTENANCE SCHEDULE CLOSELY.**

CAUTION:

- **DO NOT UNPLUG THE STOVE IF YOU SUSPECT A MALFUNCTION. TURN THE ON/OFF SWITCH TO "OFF' AND CONTACT YOUR DEALER.**
- **THE HEATER WILL NOT OPERATE DURING A POWER OUTAGE. IF A POWER OUTAGE DOES OCCUR, CHECK THE HEATER FOR SMOKE SPILLAGE AND OPEN A WINDOW IF ANY SMOKE SPILLS INTO THE ROOM.**

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

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

Wood Energy Technical Training www.wettinc.ca

Your heater should be installed by a qualified NFI (US) or WETT (Canada) technician. To find the nearest qualified installer, go to:

https://nficertified.org,

https://www.wettinc.ca/

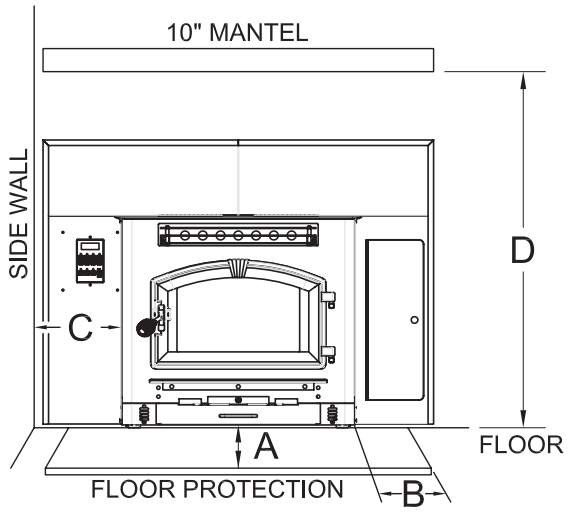
INSTALLATION CONFIGURATIONS

This insert may be installed as follows:

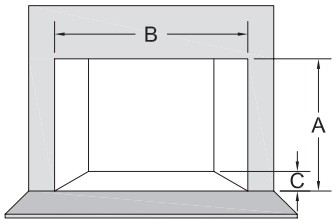
1. In a pre-fab firebox (Factory Built)
2. In an existing masonry fireplace
3. As a build-in

FLOOR PROTECTION

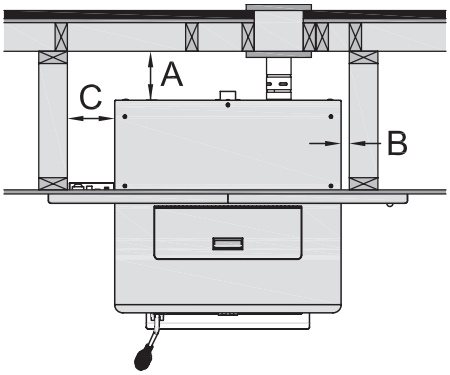
This heater may be installed on a combustible floor, with proper floor protection, or on a masonry hearth. The hearth or noncombustible floor protector must extend a minimum of 6” (152mm) in front and 6” (152mm) from each side of the unit.

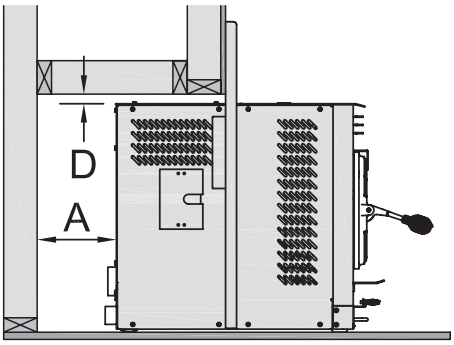


A	FLOOR PROTECTOR TO FRONT OF UNIT	6”
B	FLOOR PROTECTOR TO SIDE OF UNIT	6”
C	LEFT SIDE OF UNIT TO WALL	8”
D	FLOOR TO MANTEL	53”



A	HEIGHT	24”
B	WIDTH	40”
C	DEPTH	20”





A	BACK OF UNIT TO WALL	6”
B	RIGHT SIDE OF UNIT TO WALL	1”
C	LEFT SIDE OF UNIT TO WALL	6”
D	TOP OF UNIT TO WALL	1”

OUTSIDE AIR SUPPLY (OPTIONAL, UNLESS INSTALLING IN A MOBILE HOME)

Depending on your location and home construction, outside air may be necessary for optimal performance. Your stove is approved to be installed with an outside air intake (69FAK) which is necessary for a mobile home. You can purchase the 69FAK through your heater dealer. Installation instructions are supplied with the air intake kit.

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

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

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

- This stove must be securely fastened to the floor of the mobile home using two 1/4" lag bolts that are long enough to go through both a hearth pad, if used, and the floor of the home.
- The heater must be electrically grounded to the steel chassis of the mobile home with 8 GA copper wire using a serrated or star washer to penetrate paint or protective coating to ensure grounding.
- Vent must be 3 or 4-inch "PL" Vent and must extend a minimum or 36" (914 mm) above the roof line of the mobile home and must be installed using a certified ceiling fire stop and rain cap.
- When moving your mobile home, all exterior venting must be removed while the mobile home is being relocated. After relocation, all venting must be reinstalled and securely fastened.
- Outside Air is mandatory for mobile home installation. See Outside Air Supply section and your dealer for purchasing.
- Check with your local building officials as other codes may apply.

INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.

- A UL listed 3" or 4" type "PL" pellet vent exhaust system must be used for installation and attached to the pipe connector provided on the back of the heater. Use a 3" to 4" adapter for 4" pipe. A 4" PL is required for elevations above 2,500 feet above sea level.
- Do not terminate vent in any enclosed or semi-enclosed area, such as; carports, garage, attic, crawl space, under a sundeck or porch, narrow walkway or close area, or any location that can build up a concentration of fumes such as a stairwell, covered breezeway etc.
- Vent surfaces can get hot enough to cause burns if touched by children. Noncombustible shielding or guards may be required.
- Do not install a flue damper in the exhaust vent of this unit.
- Termination must exhaust above air inlet elevation. Installation MUST include three (3) vertical feet of pellet vent pipe. This will create some natural draft to prevent the possibility of smoke or odor during appliance shutdown and to keep exhaust from causing a nuisance or hazard from exposing people or shrubs to high temperatures. Do not connect this unit to a chimney flue serving another appliance. Do not connect directly to a masonry chimney.
- The installation must include a cleanout tee to enable collection of fly ash and to permit periodic cleaning of the exhaust system. 90° elbows accumulate fly ash and soot thereby reducing exhaust flow and performance of the heater. Each elbow or tee reduces draft potential by 30% to 50%. Use no more than 180 degrees of elbows (two 90° elbows, or two 45° and one 90° elbow, etc.) and one cleanout tee to maintain adequate draft. Cleanout tees and elbows should not be connected to the rear of the unit unless a 3-inch adapter is used.
- Total length of horizontal vent must not exceed 48" (4ft.)/1,200mm. The maximum recommended vertical venting height is 12-feet for 3-inch type "PL" vent. For venting higher than 12-feet, 4-inch "PL" vent must be used. All joints in the vent system must be fastened by at least 3 screws, and all joints must be sealed with RTV silicone sealer to be airtight.
- The area where the vent pipe penetrates to the exterior of the home must be sealed with silicone or other means to maintain the vapor barrier between the exterior and the interior of the home.

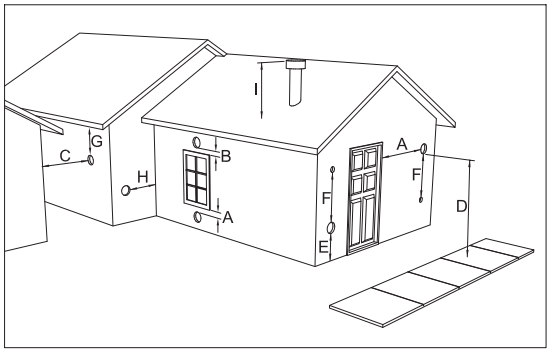
NOTE: These are guidelines only. Proper venting is accomplished by design and necessary requirements. In most installations 3 inch diameter venting is adequate. If it does not vent properly you will have to change it to 4 inches. You should not exceed 4 inch diameter venting.

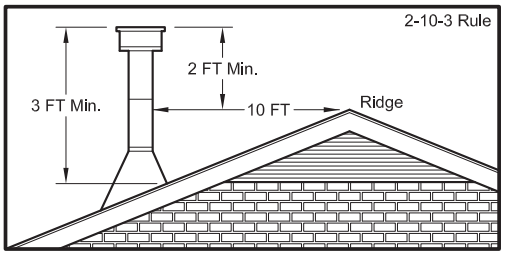
DO NOT CONNECT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM

IMPORTANCE OF PROPER DRAFT

Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance. Inadequate draft may cause backpuffing into the room and 'plugging' of the chimney. Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints. An uncontrollable burn or excessive temperature indicates excessive draft. Take into account the chimney's location to ensure it is not too close to neighbors or in a valley which may cause unhealthy or nuisance conditions. It is recommended that only an authorized installer install your heater, preferably an NFI certified specialist. The following installation guidelines must be followed to ensure conformity with both the safety listing of this heater and to local building codes.

VENT TERMINATION CLEARANCES





D. Min. 4-ft clearance below or beside any door or window that opens.

E. Min. 1-ft clearance above any door or window that opens.

F. Min. 3-ft clearance from any adjacent building.

G. Min. 7-ft clearance from any grade when adjacent to public walkways.

H. Min. 2-ft clearance above any grass, plants, or other combustible materials.

I. Min. 3-ft clearance from a forced air intake of any appliance.

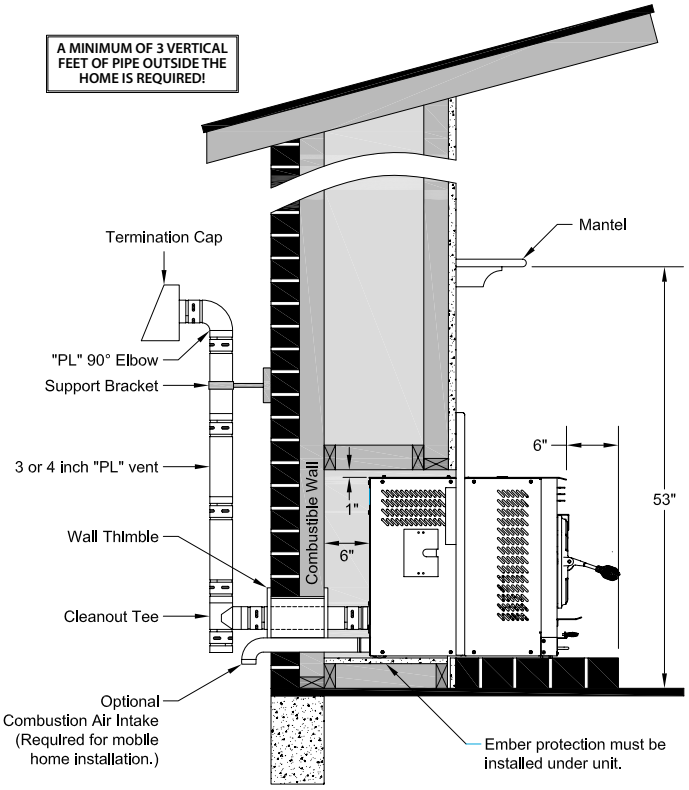
J. Min. 2-ft clearance below eaves or overhang.

K. Min. 1-ft clearance horizontally from combustible wall.

L. Must be a minimum of 36-inches above the roof and 24-inches above the highest point or the roof within 10-feet.

INSTALLATION AS A BUILT-IN FIREPLACE

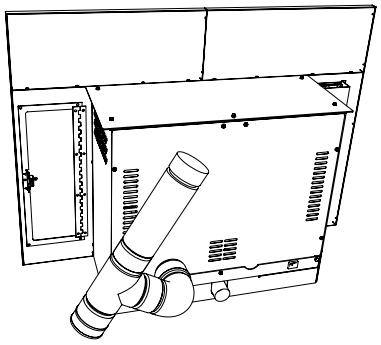
A continuous sheet of non-combustible floor protection must be installed underneath the unit to prevent the possibility of embers falling through to the combustible floor. If the floor beneath the unit is of non-combustible material, the protector is not required. See the "Clearance to Combustibles" section of this manual for installation clearances.



ALTERNATIVE EXHAUST VENTING

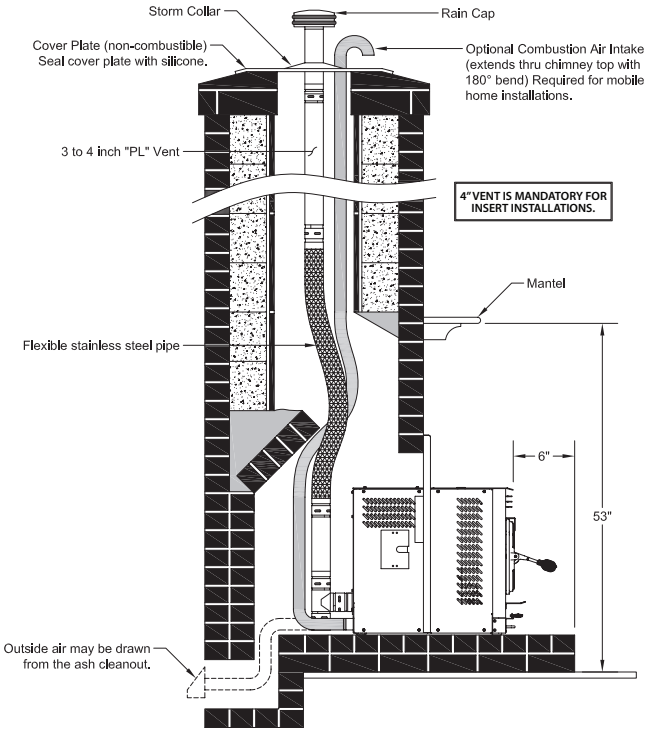
Depending on your installation, you might consider routing your cleanout tee as illustrated below for ease of cleaning. The access panel in the right side facade allows you to reach the tee from the front side of the unit if venting is assembled as shown. The cleanout tee is attached to a 90° elbow mounted to the unit then rotated at approx. 15-20 degrees. A 12 inch section of "PL" vent is connected to reach the top of the unit to which a flexible

pipe may be attached for further termination through a chimney. Clearance to combustibles must be considered if this installation is chosen. A distance of 3 inches must be maintained from the exhaust vent to any combustible material.



INSTALLATION INTO A MASONRY FIREPLACE

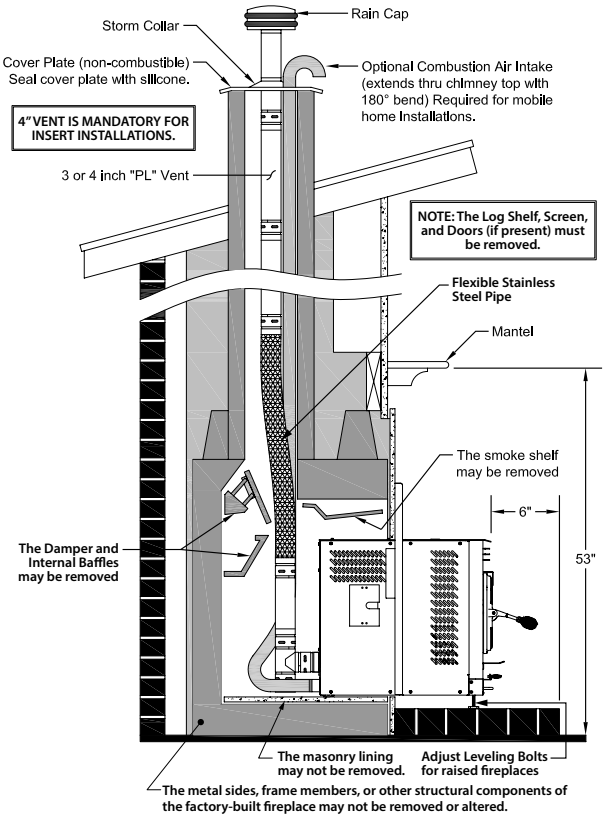
(4" Pell Vent "PL" Piping) that extends the full height of the chimney and meets type HT requirements. The liner must be securely attached to the insert and the chimney top. The chimney must be sealed either at the top or at the damper area with a non-combustible plate to prevent room air passage to chimney cavity. Outside combustion air may be drawn through the chimney top or through an existing ash cleanout.



When installing into a masonry fireplace, DO NOT remove any bricks or masonry, with the following exception: masonry or steel, including the damper plate, may be removed from the smoke shelf and adjacent damper frame, if necessary, to accommodate a chimney liner. Do this only if their removal will not weaken the structure of the fireplace or the chimney, and will not reduce protection for combustibles to less than that required by national building codes. Installation must include a chimney liner.

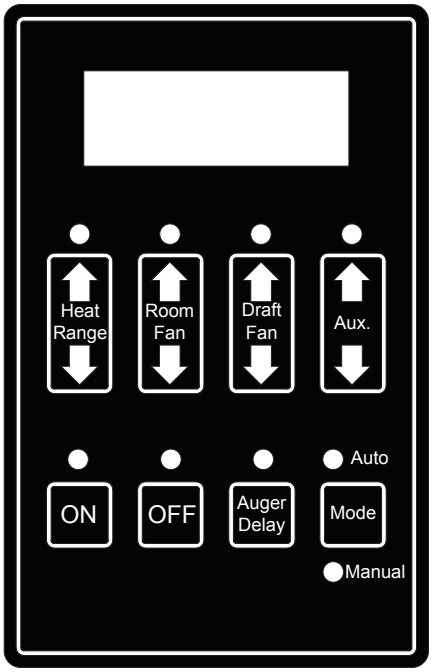
INSTALLATION INTO A FACTORY-BUILT (METAL) FIREPLACE

When installing into a zero clearance fireplace, The firebox must accept the insert without modification other than removing bolted or screwed together pieces such as smoke shelf/deflectors, ash lips, screen or door tracks, and damper assemblies. These items must be re-installed if the insert is removed and not replaced. The removal of any part must not alter the integrity of the listed fireplace in any way. The factory built fireplace must be listed per UL 127. Installation must include a chimney liner (4" Pell Vent "PL" Piping) that extends the full height of the chimney and meets type HT requirements. The liner must be securely attached to the insert and the chimney top. The chimney must be sealed either at the top or at the damper area with a non-combustible plate to prevent room air passage to chimney cavity. For raised hearth installations, adjust the leveling bolts under the front of the unit.



NEVER OPERATE THIS PRODUCT WHILE UNATTENDED

UNDERSTANDING THE CONTROL BOARD



Turning the heater OFF/ON, as well as adjustments for the fuel feed rate and room fan speed are performed by pressing the appropriate button(s) on the control panel.

This unit has two fuel operation modes. It may also be changed between an automatic operation or a manual operation in either of the fuel modes.

- Pressing the “ON” button on the control panel will begin the start-up sequence for the heater. The start-up sequence differs depending on which fuel operation mode you select (see Lighting Instructions for details). Pressing and holding the “ON” button will rotate the auger continuously until the button is released, which feeds additional fuel.
- Pressing the “OFF” button on the control panel will cause the heater to enter its shut-down sequence. The fuel feed system will stop pulling fuel from the hopper and, once the fire goes out and the heater cools down, the fans will stop running.
- Pressing the “Heat Range” arrows, up or down, will adjust the amount of fuel being delivered to the burnpot.
- The draft fan (exhaust) will come on as soon as the “ON” button is pressed. The fan will automatically adjust its speed in accordance to the heat range setting. However, this speed can be manually operated by pressing the “Draft Fan” arrows up or down. “Draft Fan” when pressed, the display will show “DF-A”, which is automatic. Press the arrows again to adjust fan speed. When adjusting the draft fan setting, try only
- One setting above or below the heat setting. It is better to leave the heater in the automatic mode and adjust the manual draft slide to control the combustion air.
- The room fan will come on once the unit has reached operating temperature (approx. 110°F). By pressing the “Room Fan” buttons, the display will show “RF-A” which is automatic or “RF-1” through “RF-9” for manual settings. In auto mode, the room fan’s speed will automatically be adjusted in accordance with the heat range setting. By pressing the “Room Fan” up arrow, you can adjust the fan speed setting up to “RF-9”. The fan speed can be adjusted to a higher setting than the heat setting but not lower than the corresponding heat range.
- The “Aux” button is for Agitator operation. When the unit is “OFF” and the heater is cool, pressing the “Aux” arrows will rotate the agitator for easy removal for cleaning. The agitator, when in Automatic mode, will operate at set intervals. However, these can be changed by pressing the arrows on the “Aux” button. The agitator can be adjusted from 0 to 9, setting “0” is off and setting “9” is high.
- The “Auger Delay” button can be used to pause rotation of the Auger and Agitator for approx. 1 minute. This can be cancelled by pressing the “ON” button. The “Auger Delay” is normally used only during the start up cycle to slow the fuel delivery down during the initial ignition.
- The “Mode” button is used to switch between manual and automatic mode. When in auto mode, the fan, auger, and agitator will operate at preset intervals unless changed manually using the buttons mentioned above. When in manual mode, the draft fan (exhaust) will operate at full speed (100%), so the air must be controlled with the manual slide damper just below the viewing door. When the heater is in the manual mode, the optional thermostat will not properly control the unit.
- During normal operation, the unit is constantly monitored for problems. In the event of an error condition, the unit will stop and an error will be displayed. See the list of error codes found at the end of this manual.

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

DO NOT BURN:

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

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

PROPER FUEL

ATTENTION:
THIS APPLIANCE IS DESIGNED FOR THE USE OF PELLETIZED FUEL THAT MEET OR EXCEED THE STANDARD SET BY THE PELLET FUEL INSTITUTE (PFI). IN ADDITION TO PELLET FUEL, THIS STOVE IS APPROVED BY THE EPA TO BURN DRIED CORN.

Your multi-fuel stove is designed to burn premium hardwood pellets that comply with the Pellet Fuels Institute (PFI) standard (minimum of 40 lbs density per cubic ft, 1/4" to 5/16" diameter, length no greater than 1.5", not less than 8,200 BTU/lb, moisture under 8% by weight, ash under 1% by weight, and salt under 300 parts per million). Pellets that are soft, contain excessive amounts of loose sawdust, have been, or are wet, will result in reduced performance. Store your pellets in a dry place. DO NOT store the fuel within the installation clearances of the unit or within the space required for refuelling and ash removal. Doing so could result in a house fire. Do not over fire or use volatile fuels or combustibles, doing so may cause a personal and property damage hazards. Factory-approved pellets are those 1/4" or 5/16" in diameter and not over 1" long. Longer or thicker pellets sometimes bridge the auger flights, which prevents proper pellet feed. Burning wood in forms other than pellets is not permitted. It will violate the building codes for which the stove has been approved and will void all warranties. The design incorporates automatic feed of the pellet fuel into the fire at a carefully prescribed rate. Any additional fuel introduced by hand will not increase heat output but may seriously impair the stoves performance by generating considerable smoke. Do not burn wet pellets. The stove's performance depends heavily on the quality of your pellet fuel. Avoid pellet brands that display these characteristics:

- Excess Fines – "Fines" is a term describing crushed pellets or loose material that looks like sawdust or sand. Pellets can be screened before being placed in hopper to remove most fines.
- Binders – Some pellets are produced with materials to hold the together, or "bind" them.
- High ash content – Poor quality pellets will often create smoke and dirty glass. They will create a need for more frequent maintenance. You will have to empty the burn pot plus vacuum the entire system more often. Poor quality pellets could damage the auger. We cannot accept responsibility for damage due to poor quality pellet.
- Your corn needs to be clean and dry, and you should never burn any seed corn or other chemically treated corn, old corn, corn with mildew or mold, etc.
- Corn should be dried to 11-12%. If you are buying corn from a retail supplier, make sure it is intended to be sold (and burned) as fuel. If you are buying direct from a farmer in bulk, make sure you communicate what you are doing with the corn and that you need it dried sufficiently so you don't have problems.
- If your corn has too much moisture, it will cause a variety of problems including lighting, consistent flame and heat, smoke, and more.

- Corn burns hotter than wood pellets. Be prepared for more heat output. Sometimes a corn burning appliance can heat your home to your desired temp on its lowest level. When you first start burning corn, especially if you're used to wood pellets, you'll want to start out on a lower setting and slowly turn it up as needed.
- When you burn corn, you'll occasionally get "Klinkers" which is a build up. You can eliminate or greatly reduce any buildup of the Klinker by making sure that your corn is free from dust, dirt, corn fines, pieces of stalk and other debris. Having your fuel at 11-12 percent moisture will also help out in reducing the Klinker buildup. Remember that you can mix corn with wood pellets. Doing so will extend one fuel, as well as help avoid klinkers.

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

PRE-START-UP CHECK

Remove burn pot, making sure it is clean and none of the air holes are plugged. Clean the firebox, and then reinstall burn pot. Clean door glass if necessary (a dry cloth or paper towel is usually sufficient). Never use abrasive cleaners on the glass or door. Choose which fuel setting that you wish to operate in. Do this by first pressing the "ON" button, then press the "Heat Range" Up and Down arrows together for approximately 3-4 seconds and release. A "C" or "P" in the first digit of the display will indicate the mode. The "ON" led will be blinking and the display will show "CR-1" or "PR-1", depending on the mode. The "Heat Range" indicator LED and the "Auto" LED should be lit and the dash in the Heat Range display should be flashing. You will notice the draft fan starts immediately. If you press the "Heat Setting" button up, the draft fan changes speed, increasing speed the higher the heat setting. You should begin to see the igniter, located in the center and behind the burnpot, begin to glow after a short period of time. In CR-1, the auger and agitator will start rotating after a few minutes, allowing for proper fuel ignition. In PR-1, the auger will turn immediately, then the agitator will begin to rotate once the heater reaches operating temperature. Note: The room fan will not operate at this time, as a temperature of at least 110°F must be reached before operating. If proper operation of your heater is confirmed, press the "OFF" button, then fill your hopper with fuel. Ensure there is no foreign matter in your fuel, hopper or burnpot.

BUILDING A FIRE

Never use a grate or other means of supporting the fuel. Use only the burn pot supplied with this heater. Hopper lid must be closed in order for the unit to feed pellets. During the start-up period:

- Make sure the burn pot is free of pellets.
- DO NOT open the viewing door.
- DO NOT add pellets to the burn pot by hand.

NOTE: During the first few fires, your stove will emit an odor as the high-temperature paint cures or becomes seasoned to the metal. Maintaining smaller fires will minimize this. Avoid placing items on the stovetop during this period because the paint could be affected. Attempts to achieve heat output rates that exceed heater design specifications can result in permanent damage to the heater.

OPTIMAL OPERATION

This multi-fuel stove has been certified by the US EPA to meet strict 2020 guidelines. To Insure this unit produces the optimal minimal emissions, it is critical to follow the following guidelines. To achieve a "high burn" your stove should be set on setting 5 with the damper fully open. To achieve a "medium burn" your stove should be set on setting 1 with the damper fully closed. To achieve a "low burn" your stove should be set on setting 1 with the damper closed. Settings 2, 3 & 4 will give you a higher heat output above medium and the damper should be open for these settings. If the door is opened while the stove is in operation it must be closed within 30 seconds or the stove will shut down. If the stove shuts down push the "On/Off" button to re-start your stove. The stove will have to fully shut down and turn off before you will be able to restart the stove.

IGNITOR

- Close all doors, lids, and cleanouts.
- Press the "ON" button and select desired heat range. This will start the ignition sequence.
- At this point, the igniter will come on and run for preset time limit (approximately 9 minutes). The auger will begin to turn and feed fuel into the burnpot. After the 9 minutes or if the heater reaches operating temperature, the igniter will shut off and normal operation will begin.

- Make fine adjustments to the air/fuel with the damper located centered, under the hearth.
- Once the heater reaches warm temperature, the room fan will start to circulate air into the room.
- If you would like to increase the life of your ignitor, you can run your heater in the “CR” mode. However, you must place pellets in the burnpot, up to the igniter level as shown in the illustration below for auto ignition. Close the door and press the “ON” button. The igniter only runs approximately half the time in “CR” as oppose to the “PR” mode.

OPENING DOOR

CAUTION:

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

If the door is opened while the stove is in operation it must be closed within 30 seconds or the stove will shut down. If the stove shuts down push the “On/Off” button to re-start your stove. The stove will have to fully shut down and turn off before you will be able to restart the stove.

TAMPER WARNING

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

REFUELLING

WARNING:

- **KEEP HOPPER LID CLOSED AT ALL TIMES EXCEPT WHEN REFILLING.**
- **DO NOT OVERFILL HOPPER.**

CAUTION:

- **NEVER PLACE YOUR HAND NEAR THE AUGER WHILE THE STOVE IS IN OPERATION.**
- **WE RECOMMEND THAT YOU NOT LET THE HOPPER DROP BELOW 1/4 FULL.**

CAUTION:

- **THE HOPPER AND STOVE TOP WILL BE HOT DURING OPERATION; THEREFORE, YOU SHOULD ALWAYS USE SOME TYPE OF HAND PROTECTION WHEN REFUELING YOUR STOVE.**
- **DO NOT TOUCH THE HOT SURFACES OF THE STOVE. EDUCATE ALL CHILDREN ON THE DANGERS OF A HIGH-TEMPERATURE STOVE. YOUNG CHILDREN SHOULD BE SUPERVISED WHEN THEY ARE IN THE SAME ROOM AS THE STOVE.**

SHUTDOWN PROCEDURE

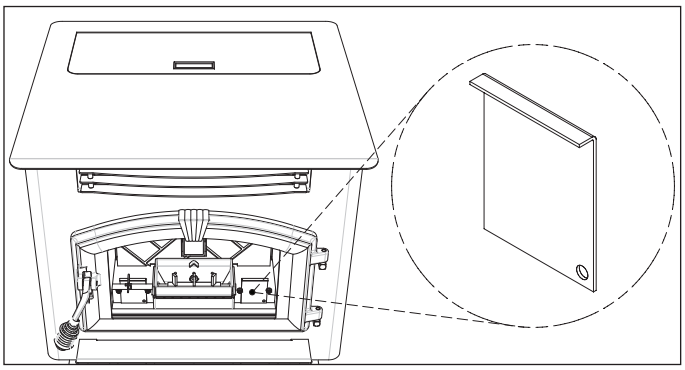
WARNING:

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

Pressing the OFF button will cause the heater to enter a shutdown mode. If the heater has reached operating temperature, the “OFF” Indicator will blink until the shutdown procedure succeeds in lowering the heater temperature. The Room Fan will stay on to cool the heater, and the Exhaust Fan will stay on to remove smoke and heat from the combustion chamber. The Agitator will rotate continuously until shutdown is complete. The Auger will bump the fuel out every few seconds to prevent the fuel in the auger from burning. Once the temperature of the burn chamber falls below approximately 90°F and the pressure switch detects that the door is closed, the fans will stop and the Auger will run for a few seconds to purge the auger system of any burned fuel. At this point, the “OFF” Indicator will go out and the heater will turn completely off. If during burning, the heater reached at least 120°F, the shutdown procedure will include a 15 minute shutdown cycle that will keep the heater in the shutdown state for at least 15 minutes regardless of whether it is cool or pressure is detected. The 15 minute cycle can be turned off by pressing the off button during shutdown. This will cause the system to exit shutdown and return to the “OFF” mode as soon as the door is closed and the heater is cool. Continue to monitor the heater / insert after the shutdown procedure has begun. And remember, varying ambient conditions may result in a lengthy period of time for adequate cool down and the resultant shut down. Be patient, this is normal. The control board is telling the heater / insert to gradually “shut down,” rather than initiate a sudden halt of fuel to the fire pot. In this way, the possibility of smoke entering the home is avoided.

INTERIOR CHAMBERS

- Periodically remove and clean the burn pot and the area inside the burn pot housing. In particular, it is advisable to clean out the holes in the burn pot to remove any build up that may prevent air from moving through the burn pot freely.
- Remove the small clean-out slides in the lower corners of the firebox. Tap the sides of the burn chamber with a wooden stick. Do not tap the firewall behind the burn box as it may damage the ceramic firebrick. Scrape the fly ash from the clean-out chambers toward the front of the burn chamber. Remove the fly ash from the burn chamber and replace the clean-outs.



- Remove the ash pan and dump the ash into a metal container.
- Cleaning of the exhaust system will depend upon the ash and debris content of your fuel. If your fuel has a high ash content and/or significant debris in it, your exhaust system will require weekly cleaning. Cleaner fuels will allow for monthly cleaning of the exhaust system. Remove the exhaust pipe from the back of your heater and remove any ash that may have collected in the pipes. Replace the pipes to the heater and seal with high temperature seal tape. If you have installed proper clean out tees you will not have to take the chimney sections apart.

NEVER OPERATE THIS PRODUCT WHILE UNATTENDED

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

CREOSOTE FORMATION, INSPECTION, & REMOVAL

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

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

FLY ASH

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

ASH REMOVAL & DISPOSAL

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

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

SMOKE & CO MONITORS

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

CHECK & CLEAN THE HOPPER

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

DOOR & GLASS GASKETS

Inspect the main door and glass window gaskets periodically. The main door may need to be removed to have frayed, broken, or compacted gaskets replaced by your authorized dealer. This unit's door uses a 1" diameter rope gasket.

BLOWER MOTORS

Clean the air holes on the motors of both the exhaust and distribution blowers annually. Remove the exhaust blower from the exhaust duct and clean out the internal fan blades as part of your fall start-up. If you have indoor pets your power motors should be inspected monthly to make sure they are free of animal hair build up. Animal hair build up in blowers can result in poor performance or unforeseen safety hazards.

PAINTED SURFACES

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

GLASS

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

1. Once the heater has cooled, remove the door from the heater.
2. Remove the rope gasket from the door followed by the nuts holding the glass retainer in place.
3. While wearing gloves, carefully remove any loose pieces of glass from the door frame.
4. Replace the glass and gasket, making sure the gasket runs the full perimeter of the glass edge.
5. Re-install the retainer and rope gasket using high-temperature silicone to adhere the gasket to the door.
6. Never use substitute materials for the glass.

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

FALL START UP

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

SPRING SHUTDOWN

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

MAINTENANCE SCHEDULE

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

	Daily	Weekly	Monthly or as needed
Burn Pot	Stirred	Empty	
Combustion Chamber		Brushed	
Ashes		Check	Empty
Interior Chambers			Vacuumed
Combustion Blower Blades			Vacuumed / Brushed
Convection Blower Impeller			Vacuumed / Brushed
Vent System			Cleaned
Gaskets			Inspected
Glass	Wiped	Cleaned	
Hopper (end of season)			Empty & Vacuumed

CONTROL BOARD FUNCTIONS

START-UP SEQUENCE OF EVENTS Once the control panel is turned on, a timer begins that will start, stop and continue operation of the heater as a preset temperature is achieved.		
COMPONENT	OPERATION START	OPERATION END
Draft Fan	Starts Immediately	Will continue until shutdown. Shutdown will occur when the operating temperature is below approx. 90 degrees.
Agitator	Begins to turn once the heater reaches operating temperature	Will continue intermediately, as determined by the “HEAT SETTING”, until shutdown.
Auger	In PR-1 mode: Auger turns immediately. In CR-1: Three minutes after starting, the auger will begin to turn	The auger will continue at the feed rate specified by the “HEAT SETTING”. NOTE: Safety switches, HI limit and vacuum sensor, must be activated to continue proper operation.
Room Fan	Begins to run when heater reaches operating temperature	Will continue to operate until the heater cools down to below approx. 90 degrees. This may take several hours.
Automatic Shutdown	If after 15 minutes, the heater has not reached the preset operating temperature, the unit will begin to automatically shut down.	Should the timer expire before the preset operating temperature is achieved, simply reset the heater by pressing the “ON” button.
Normal Operation	If after 15 minutes the preset operating temperature of approx. 110 degrees is achieved, normal operation will continue.	Operation will continue until either the heater’s control is to the “OFF” position, or the operating temperature falls below approx. 90 degrees. At such time the heater will default to the “Automatic Shut Down”.
Igniter	Starts immediately	Will continue operation for a preset time, then shut-off

SHUTDOWN SEQUENCE OF EVENTS Once the Heater has reached the normal operating temperature and switched to the “OFF” position, the unit will initiate a slow down, reducing the fuel rate until the heater’s “LOW LIMIT SAFETY” sensor tells the control board it is safe to shutdown.		
COMPONENT	SHUTDOWN	OPERATION END
Draft Fan	Unchanged operation until preset “OFF” temperature is achieved.	Continues until the operating temperature falls below approx. 90 degrees. May take several hours.
Agitator	Rotates continuously until preset “OFF” temperature is achieved.	Continues until the operating temperature falls below approx. 90 degrees.
Auger	Slows down to a reduced fuel setting until preset “OFF” temperature is achieved.	The auger will continue at the reduced feed rates until the operating temperature falls below approx. 90 degrees. NOTE: Safety switches, HI limit and vacuum sensor, must be activated to continue proper operation.
Room Fan	Unchanged operation until preset “OFF” temperature is achieved.	Will continue to operate until the heater cools down to below approx. 90 degrees. This may take several hours.
Automatic Shutdown	If the heater’s “HI LIMIT” sensor snaps open, this will cause an automatic shutdown. An error code will be displayed (Err1). NOTE: “HI LIMIT” errors are usually the result of operating at the highest heat setting for long periods of time, room fan failure or loose wire connection.	It is rare that the HI LIMIT temperature is reached. However, should this error occur, let the heater cool down for an hour then restart.

ERROR CODES & DISPLAY INDICATORS

CAUTION: WHEN PERFORMING ANY INTERNAL ELECTRICAL MAINTENANCE
• **MOVING PARTS INSIDE OF THE CABINET MAY CAUSE INJURY. DO NOT OPERATE UNIT WITH PANELS REMOVED OR OPEN.**
• **HOT PARTS. DO NOT OPERATE THE UNIT WITH PANEL OPEN.**
• **RISK OF ELECTRIC SHOCK. DISCONNECT POWER BEFORE SERVICING UNIT.**
• **IN THE EVENT OF COMPONENT FAILURE, REPLACE WITH THE ORIGINAL FACTORY EQUIPMENT.**

Error Code	Error Description	Possible Causes
Err1	The high limit temperature sensor has tripped.	Inadequate ventilation. Room fan failure. Exhaust Blockage. Electrical Open in the over temperature switch or wiring.
Err2	The low limit temperature sensor has tripped.	Hopper Empty. Auger output failure or jam. Poor flame or fuel quality caused fire to burn too slowly or go out. Electrical open in low temperature switch or wiring. Fire was not well established before the PCB's programmed time limit expired.
Err3	The heater was unable to reach the Room Fan On temperature within the startup time.	Poor flame or fuel quality caused fire to burn too slowly or go out. Auger output failure or jam Hopper empty on startup.
Err4	The power failed while the heater was hot, and when power was restored, the fire was out.	Electrical Open in low temperature switch or wiring. Power loss
Err5	The Auger output fuse has blown.	Auger motor jammed or bad.
Err6	The Agitator output fuse has blown.	Agitator motor jammed or bad.
Err7	The Draft Fan (Exhaust Fan) output fuse has blown.	Draft Fan motor jammed or bad.
Err8	The Room Fan output fuse has blown.	Room fan motor jammed or bad.
Err9	Zero Crossing Input failed	AC supply frequency out of range.
Err10	The Igniter output fuse has blown	Igniter output has shorted/blown or igniter overload.

DISPLAY INDICATORS

Several situations or events are indicated in normal operation by blinking display indicators or segments in the display:

Flashing On Indicator: This means that the heater is in the "Start Up" awaiting for the ignition procedure to complete.

Flashing Off Indicator: This indicates that the heater is in the "Shutdown" state waiting for the OFF button, or for a 15 minute period after the heater was turned off, or for the heater to cool down, or for the door to be closed.

Flashing Dash In Heat Range Display: This indicates that the heater is in the normal run mode and is ramping from the current heat range setting to the target heat range setting. Once the ramp is complete, the dash will stop flashing. For ramping from heat range 1 to 5, the default time is 12 minutes (with a 90 second ramp time).

Flashing Heat Range Value In "Heat Range" Display: For example, if the display is showing "Hr-3" and the '3' is blinking, this indicates that the heater thermostat input is open and not calling for heat. While this is happening, the actual heat range value is 1 (low).

Flashing Automatic Mode Indicator: This indicates that the heater is in normal operation and is running in the automatic mode. However, either the Draft Fan or Auxiliary setting is manually configured.

Flashing Draft Fan Setting Indicator: This indicates that the heater is in normal operation and that the vacuum sensor detects a loss of pressure either because the door is open or because there is a negative pressure in the room with respect to the exhaust.

Flashing Aux Indicator: This indicates that the igniter is on during the lighting stage.

Quick (changes twice per second) Flashing Heat Range Setting Indicator: This indicates that the heater is in normal operation and that an over temperature condition exists causing the fuel to stop.

Slow (changes once per second) Flashing Heat Range Setting Indicator: This indicates that the heater is in a cutback condition in an attempt to prevent an over temperature shutdown.

FACTORY DEFAULTS

To return the control to its original factory default settings, press and hold the AUX UP and AUX DOWN buttons together for three seconds.

HOW TO ORDER REPAIR PARTS

For Parts Assistance Call: 800-750-2723 Ext 5051 or Email: parts@usstove.com

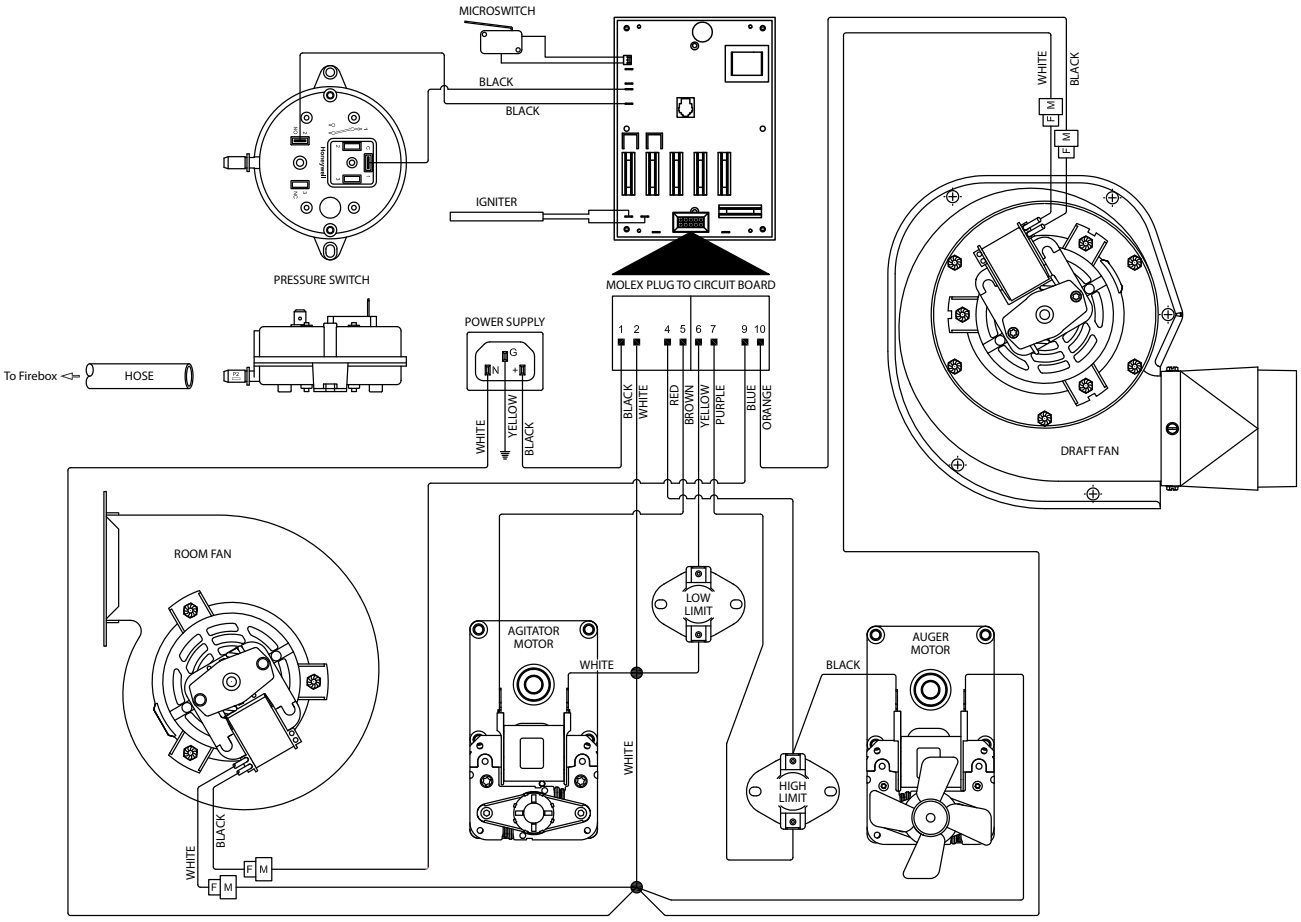
The information in this owner's manual is specific to your unit. When ordering replacement parts the information in this manual will help to ensure the correct items are ordered. Before contacting customer service write down the model number and the serial number of this unit. That information can be found on the certification label attached to the back of the unit. Other information that may be needed would be the part number and part description of the item(s) in question. Part numbers and descriptions can be found in the "Repair Parts" section of this manual. Once this information has been gathered you can contact customer service by phone 1-800-750-2723 Ext 5051 or Email parts@usstove.com.

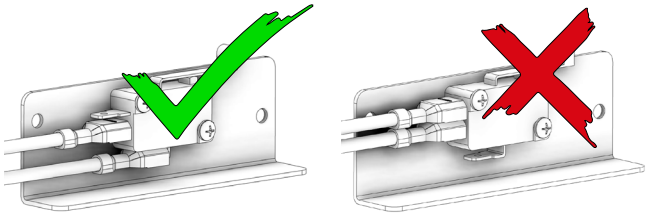
Model Information	
Model Number	
Serial Number	

- Disconnect the power supply before performing any maintenance! NOTE: Turning the heater to “OFF” does not disconnect the power to all of the electrical components of the heater.
- Never try to repair or replace any part of the heater unless instructions for doing so are given in this manual. All other work should be done by a trained technician.

PROBLEM	CAUSE: Too rich air/fuel mixture
Orange, lazy flame, excessive fuel build-up in the burnpot.	Clean out the burnpot Make sure the cleanouts on each side of the damper are closed completely. Not enough combustion air. Adjust the air damper to a more open position. Make sure that the viewing door is closed and sealed properly. If not, adjust the door catch or replace the gasket. Check that all outside connections are clear of any obstructions. Check the exhaust system, clean as needed.
PROBLEM	Cause: Burnpot out of fuel
Fire goes out or heater shuts down	Hopper is empty, refill the hopper Loss of draft pressure. Make sure the viewing door is closed and sealed properly. Check the outside connections for any obstructions. Check the exhaust system; clean as needed. Check that the pressure switch connection to the firebox is free of ashes or clear of any obstructions. Auger system may be jammed or there is a “bridging” of fuel in the hopper preventing fuel flow into the auger feed system. Too much combustion air. Adjust damper to a more closed position.
PROBLEM	Cause: Auto-Start Igniter fails to ignite the fuel in the burnpot.
Heater does not start a fire when the “ON” button is pressed.	Check the pellets quality. If moist or damp, replace with dryer fuel. Check that the auto-start igniter port is not blocked with ash or soot. (The igniter is located behind the burnpot.) The auto-start igniter should glow on start-up. If you can not visible see the igniter glowing, then it may need to be replaced or there is a problem with the electrical system. Check wiring. Loss of draft pressure. Make sure the viewing door is closed and sealed properly. Check the outside connections for any obstructions. Check the exhaust system; clean as needed.
PROBLEM	Cause: Not enough combustion air or fuel has too much moisture.
Viewing glass becomes black shortly after start-up.	Adjust the air damper to a more open position. Use a fuel with less moisture content.
PROBLEM	Cause: Not enough combustion air or fuel has too much moisture.

WIRING DIAGRAM

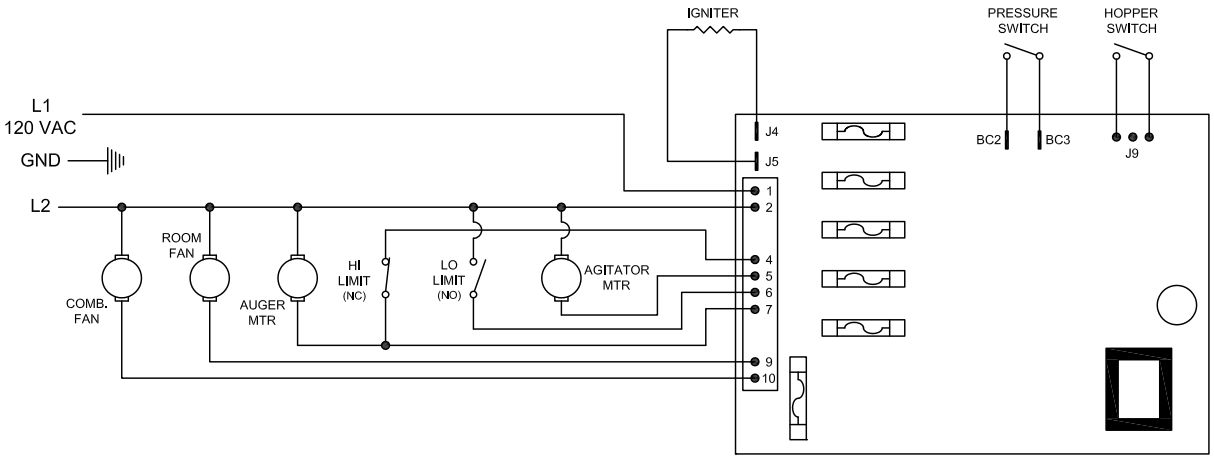


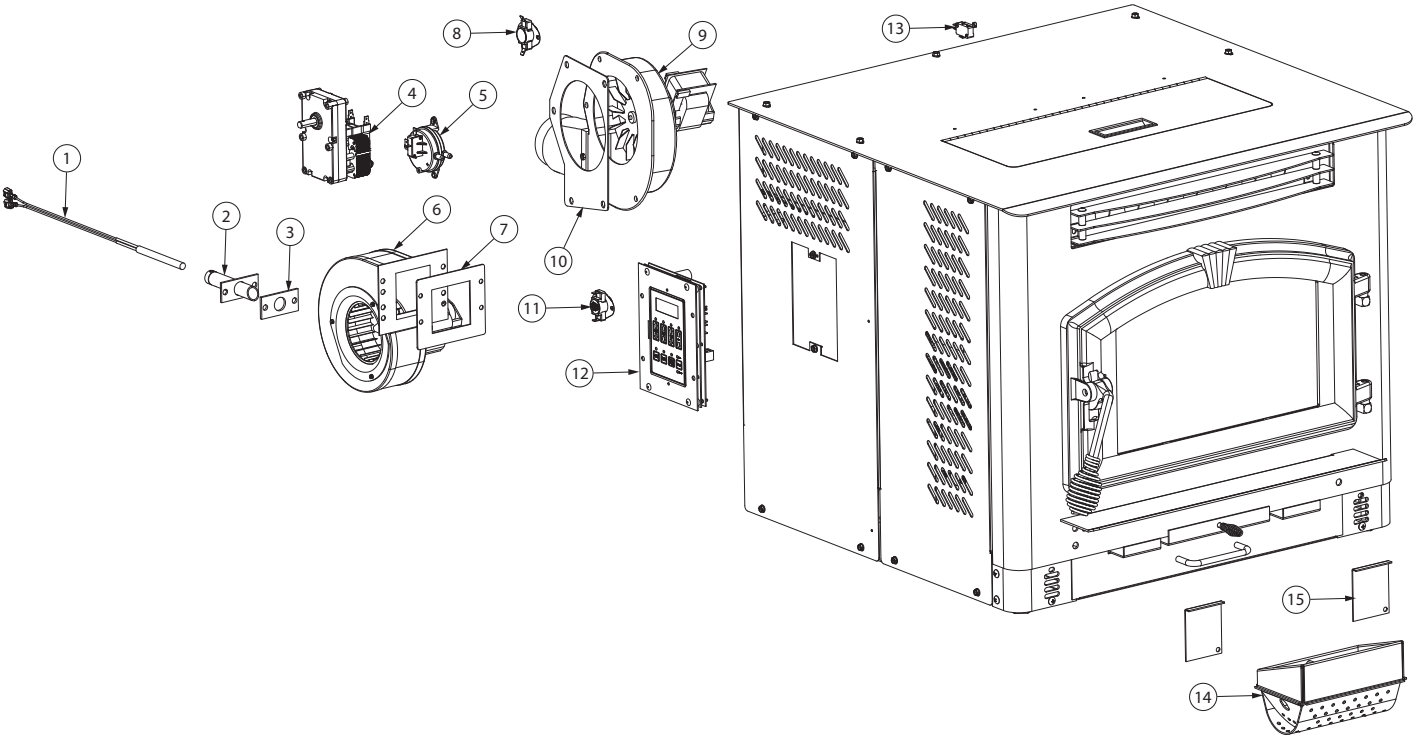


CORRECT **WRONG**

Ensure the wires are connected to the bottom two prongs of the hopper switch as shown.

WIRING SCHEMATIC





Key	Part #	Description	Qty
1	80543	Igniter Cartridge	1
2	69593	Igniter Tube Weldment	1
3	88118	Igniter Flange Gasket	1
4	80456	Drive Motor (Agitator)	1
5	80549	Pressure Switch	1
6	80472	Distribution Blower	1
7	88106	Distribution Blower Gasket	1
8	80381	110°F Snap Disc (Low Limit)	1
9	80473	Exhaust Blower	1
10	88100	Exhaust Blower Gasket	1
11	80390	170°F Snap Disc (High Limit)	1
12	80575	PCB, Circuit Board	1
13	80491	Micro Switch	1
14	891660	Burnpot	1
15	25524	Ash Cleanout (Inner)	2

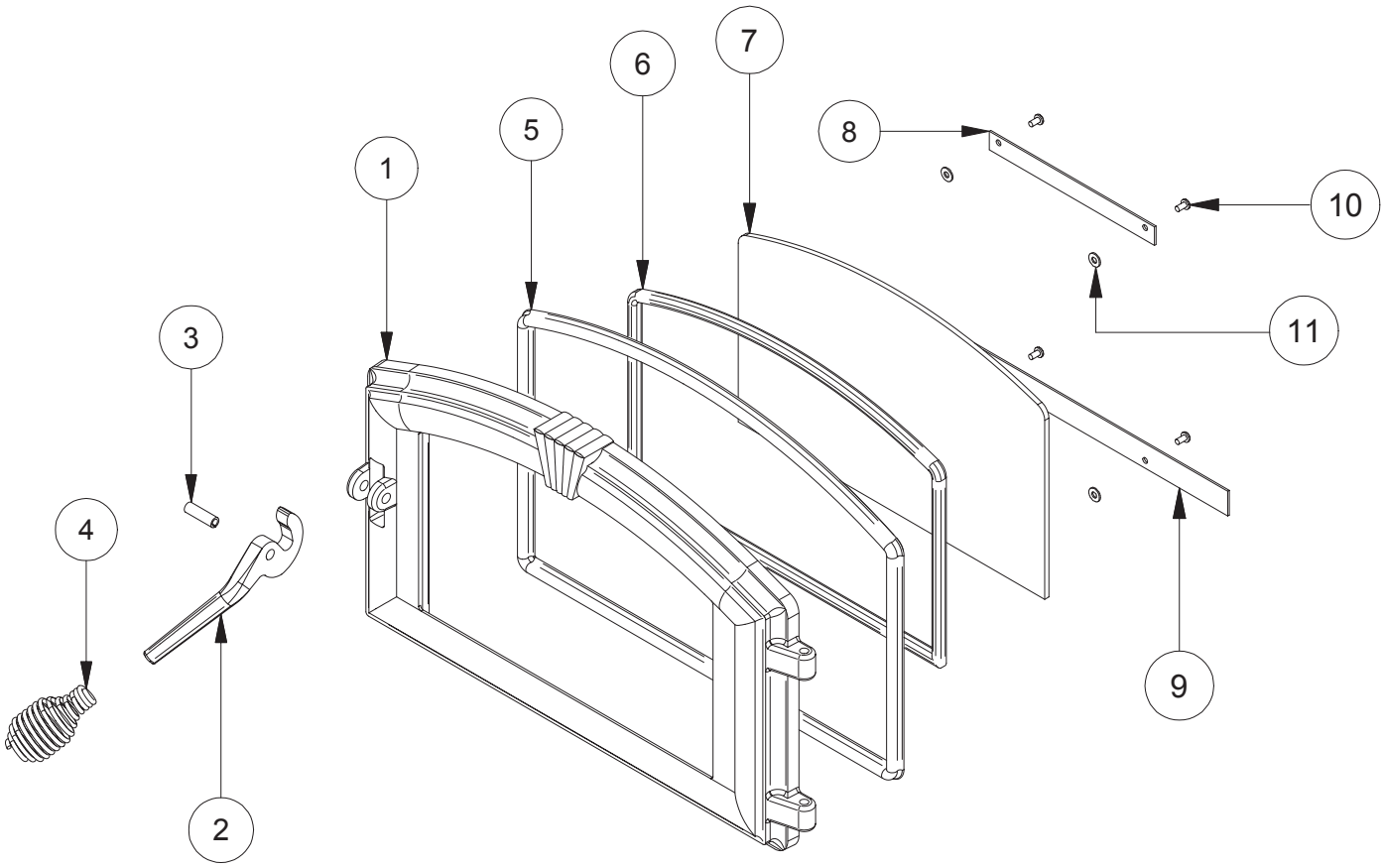
To order parts:

Call 1-800-750-2723 Ext 5051 or

Email to: parts@usstove.com

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

REPAIR PARTS



Key	Part #	Description	Qty
1	25491	Feed Door	1
2	25492	Handle, Door	1
3	83506	Roll Pin, 3/8 x 1-1/4	1
4	891135	Handle, Spring (Parts Bag)	1
5	88112	Gasket, 1/2” Sq. Rope	5 ft
6	88087	Gasket, Glass (1 x 3/16)	4 ft
7	891131	Glass Ceramic	1
8	25464	Retainer, Top Glass	1
9	25465	Retainer, Bottom Glass	1
10	83202	Machine Screw	4
11	83278	#10 Flat Washer	4

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SERVICE RECORD

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

SERVICE PROVIDER

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

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

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

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

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

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

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

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

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

NOTES

Limited Warranty

The operation of this unit in a manner inconsistent with the owner's manual will void the warranty and is also against federal regulations. United States Stove Company warrants this product to be free from defects in material and workmanship, to the original retail purchaser only, for the time period identified below, measured from the date of the initial purchase as evidenced on an invoice, cancelled check, sales receipt, etc., to receipt of a claim by United States Stove Company ("USSC") or an authorized dealer, as follows:

TIME PERIOD	
Firebox / Heat Exchanger	Limited Lifetime
Door	One Year
Cabinets and Trim	One Year
Gaskets	One Year
All Electrical Components (Blower, Auger / Agitator Motor, PC Board, Switches)	One Year
Ceramic Glass	One Year

WARRANTY CONDITIONS

- This warranty only covers USSC appliances that are purchased through an USSC authorized retailer, dealer or distributor.
- This warranty is only valid while the USSC appliance remains at the site of original installation. This warranty does not apply to products purchased for rental use.

CLAIM PROCEDURE

Contact United States Stove Company for warranty service. You will be asked to provide detailed descriptions and pertinent data, including proof or purchase which will be returned upon request. Providing the heater has been installed and used in accordance with the Owner's Manual supplied with the heater and the issue does not fall under a situation of exclusion, United States Stove Company will either:

- Replace the defective part free of charge. Parts and/or service replacements made under the terms of this warranty are warranted only for the remaining period of the original heater warranty.
- Replace the heater free of charge. Should the heater be replaced by United States Stove Company "free of charge", all further warranty obligations are thereby met.
- Where the defect is of a cosmetic (non-functional) nature, United States Stove Company will bear reasonable expense to repair the heater, including such items as welding, painting, and incidental labor. A "reasonable expense" is defined by terms of this warranty as $30.00/hour with full refund for any purchase of parts.

WARRANTY EXCLUSIONS

This warranty does not cover the following:

- Damage to or changes in surface finishes as a result of normal use. As a heating appliance, some changes in color or interior and exterior surface finishes may occur. This is not a flaw and is not covered under warranty.
- Damage to printed, plated, or enameled surfaces caused by fingerprints, accidents, misuse, scratches, melted items, or other external sources and residues left on the plated surfaces from the use of abrasive cleaners or polishes.
- Repair or replacement of parts that are subject to normal wear and tear during the warranty period. These parts include: paint, pellet, and the discoloration of glass.
- Minor expansion, contraction, or movement of certain parts causing noise. These conditions are normal and complaints related to this noise are not covered by this warranty.
- Damages resulting from: (1) failure to install, operate, or maintain the appliance in accordance with the installation instructions, operating instructions, and listing agent identification label furnished with the appliance; (2) failure to install the appliance in accordance with local building codes and/or authorities having jurisdiction; (3) shipping or improper handling; (4) improper operation, abuse, misuse, continued operation with damaged, corroded or failed components, accident, alteration, or improperly/incorrectly performed repairs; (5) environmental conditions, weather, inadequate ventilation, negative pressure, or drafting caused by tightly sealed constructions, insufficient make-up air supply, or handling devices such as exhaust fans or forced air furnaces or other such causes; (6) use of fuels other than those specified in the operating instructions; (7) installation or use of components not supplied with appliance or any other components not expressly authorized and approved by USSC; (8) modification of the appliance not expressly authorized and approved by USSC in writing; and/or (9) interruptions or fluctuations of electrical power supply to the appliance.
- Non-USSC venting components, hearth components or other accessories used in conjunction with the appliance.
- USSC's obligation under this warranty does not extend to the appliance's capability to heat the desired space. Information is provided to assist the consumer and the dealer in selecting the proper appliance for the application. Consideration must be given to appliance location and configuration, environmental conditions, insulation and air tightness of the structure.
- Problems relating to smoking or creosote. Smoking is attributable to inadequate draft due to the design or installation of the flue system or installation of the heater itself. Creosote formation is largely attributable to improper operation of the unit and/or draft as mentioned above.
- Any cost associated with product removal and re-installation, travel, transportation, or shipping.
- Service calls to diagnose trouble (unless authorized in writing by the manufacturer, distributor, or dealer).

THIS WARRANTY IS VOID IF

- The appliance has been over-fired or operated in atmospheres contaminated by chlorine, fluorine, or other damaging chemicals. Over-firing can be identified by, but not limited to, warped plates or tubes, rust colored cast iron, bubbling, cracking and discoloration of steel or enamel finishes.
- The appliance is subjected to prolonged periods of dampness or condensation.
- There is any damage to the appliance or other components due to water or weather damage which is the result of, but not limited to, improper chimney or venting installation.

LIMITATIONS OF LIABILITY

The owner's exclusive remedy and USSC's sole obligation under this warranty, under any other warranty, express or implied, or in contract, tort or otherwise, shall be limited to replacement, repair, or refund, in USSC's sole and absolute discretion. In no event will USSC be liable for any incidental or consequential damages. THE LIMITED WARRANTY SET FORTH HEREIN IS THE SOLE WARRANTY PROVIDED TO PURCHASER AND IS IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESS OR IMPLIED. USSC MAKES NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCT, OTHER THAN (i) THE LIMITED WARRANTY ABOVE, AND (ii) ANY IMPLIED WARRANTIES IMPOSED BY APPLICABLE LAW WHICH CANNOT BE WAIVED OR DISCLAIMED UNDER APPLICABLE LAW. ALL OTHER WARRANTIES OF ANY KIND, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED AND EXCLUDED TO THE FULLEST EXTENT NOT PROHIBITED BY APPLICABLE LAW. This Limited Warranty gives the purchaser specific legal rights; a purchaser may have other rights depending upon where he or she resides. Some states do not allow the exclusion or limitation of special, incidental or consequential damages, or state law may affect the duration of limitations, so the above exclusion and limitations may not be applicable.

WARRANTOR

The warrantor of record is United States Stove Company, PO Box 151, 227 Industrial Park Road, South Pittsburg, Tennessee 37380. Phone number: (800)-750-2723. Register your product on line at www.usstove.com. Save your proof of purchase, as documented in a receipt or invoice, with your records for any claims.

IMPORTANT

We congratulate you on your selection of United States Stove Company and its products. As the oldest solid fuel manufacturer in the United States (since 1869), the United States Stove Company is very proud of its products, service, employees, and satisfied customers. We would like to hear from you if you are not satisfied with the manner in which you have been handled by our distributor, dealer, representative, customer service department, parts department, or sales department. Please reach out to us by using any of the contact information listed above.

Garantie limitée

L'utilisation de cette unité en contradiction avec le manuel de l'utilisateur annulera la garantie, tout en enfreignant les règlementations fédérales. United States Stove Company garantit, uniquement à l'acheteur au détail original, que ce produit est exempt de défectuosités des matériaux et de qualité de l'exécution, pendant la période indiquée ci-dessous, de la date initiale d'achat prouvé par une facture, un chèque oblitéré, un reçu de vente, etc., de United States Stove Company (« USSC ») ou d'un détaillant autorisé, comme suit:

DÉLAI PRESCRIT	
Boîte à feu/échangeur de chaleur	À vie limitée
Porte	Un an
Cabinets et garniture	Un an
Joints d'étanchéité	Un an
Tous les composants électriques (Souffleur, moteur de la vis/agitateur, carte de circuit imprimé, commutateurs)	Un an
Vitre céramique	Un an

CONDITIONS DE LA GARANTIE

- La garantie ne couvre que les appareils USSC achetés chez un détaillant ou distributeur USSC autorisé.
- Cette garantie n'est valide que si l'appareil USSC demeure sur le site d'installation d'origine. Cette garantie ne s'applique pas aux produits achetés pour la location.

PROCÉDURE DE RÉCLAMATION

Contactez United States Stove Company pour un service sur garantie. Il vous sera demandé de fournir les descriptions et données pertinentes, incluant la preuve d'achat qui sera retournée sur demande. Sous réserve que l'appareil de chauffage ait été installé et utilisé conformément avec le Manuel du propriétaire fourni avec cet appareil de chauffage et que le problème ne porte pas sur une situation d'exclusion, United States Stove Company:

- Remplacera sans frais la pièce défectueuse. Les pièces et/ou les remplacements d'entretien effectués selon les termes de cette garantie le sont uniquement pour le reste de la période originale de la garantie de ce produit.
- Remplacer l'appareil de chauffage sans frais. Si l'appareil de chauffage doit être remplacé par United States Stove Company « sans frais », tous les engagements au titre de cette garantie seront respectés.
- Si le défaut est de nature esthétique (non fonctionnel), United States Stove Company assumera les frais pour réparation de l'appareil de chauffage, incluant les éléments comme la soudure, la peinture et la main-d'œuvre accessoire. Les « frais raisonnables » définis aux termes de cette garantie sont de 30,00 $/heure avec un remboursement complet pour tout achat de pièces.

EXCLUSIONS DE LA GARANTIE

Cette garantie ne couvre pas ce qui suit:

- Dommage ou modification du fini de la surface causé par une utilisation normale. Comme il s'agit d'un appareil de chauffage, il pourrait se produire une certaine modification de la couleur et des finis de la surface intérieure et extérieure. Il ne s'agit pas d'un défaut et ce n'est pas couvert par la garantie.
- Détérioration des surfaces imprimées, plaquées ou émaillées par les marques de doigts, accidents, abus, égratignures et pièces qui ont fondu ou autres causes externes, ainsi que les résidus laissés sur les surfaces plaquées par l'utilisation de nettoyants ou produits à polir abrasifs.
- Réparation ou remplacement des pièces soumises à une usure normale pendant la période de garantie. Ces pièces comprennent : peinture, granulés et décoloration de la vitre.
- Bruit causé par la dilatation, contraction ou déplacements mineurs de certaines pièces. Ces conditions sont normales et les réclamations liées à ce bruit ne sont pas couvertes par cette garantie.
- Dommages causés par : (1) l'installation, l'utilisation ou la maintenance de l'appareil sans tenir compte des instructions d'installation et d'utilisation, et sans consulter l'étiquette d'identification de l'agent de listé; (2) le non-respect des codes du bâtiment locaux et/ou des autorités ayant juridiction pendant l'installation de l'appareil; (3) l'expédition ou la mauvaise manutention; (4) la mauvaise utilisation, l'abus, l'utilisation continue alors que des composants sont endommagés, corrodés ou défectueux, l'utilisation après un accident, des modifications ou des réparations négligentes/incorrectes; (5) les conditions liées à l'environnement et à la météo, une mauvaise ventilation, une pression négative ou un mauvais tirage en raison de l'étanchéité de la construction, l'approvisionnement insuffisant en air d'appoint ou d'autres dispositifs tels que des ventilateurs de tirage, des chaudières à air pulsé ou toute autre cause; (6) l'utilisation de combustibles autres que ceux mentionnés dans les instructions d'utilisation; (7) l'installation ou l'utilisation de composants qui n'ont pas été fournis avec l'appareil ou de tout autre composant n'ayant pas été expressément autorisé et approuvé par USSC; (8) les modifications de l'appareil qui n'ont pas été expressément autorisées et approuvées par écrit par USSC; et/ou (9) les interruptions ou fluctuations de l'alimentation électrique de l'appareil.
- Composants d'évacuation des gaz, composants de l'âtre ou accessoires utilisés avec l'appareil et qui n'ont pas été fournis par USSC.
- Obligations de USSC, en vertu de cette garantie, ne couvrent pas la capacité de l'appareil à chauffer l'espace souhaité. Des informations sont fournies pour aider le consommateur et le détaillant lors de la sélection de l'appareil adéquat pour l'application envisagée. On doit tenir compte de l'emplacement et de la configuration de l'appareil, des conditions liées à l'environnement, de l'isolation et de l'étanchéité de la structure.
- Problèmes liés à la fumée ou au créosote. La fumée provient généralement d'un tirage inadéquat en raison de la conception ou de l'installation du système de conduit ou de l'installation de l'appareil de chauffage lui-même. La formation de créosote est largement attribuable au mauvais fonctionnement de l'unité et/ou du tirage, comme il est mentionné ci-dessus.
- Tous les coûts associés à l'enlèvement et à la réinstallation du produit, son déplacement, transport ou expédition.
- Appels de service afin de diagnostiquer les problèmes (à moins d'être reconnu par écrit par le fabricant, le distributeur ou le détaillant).

CETTE GARANTIE EST ANNULÉE SI

- L'appareil a subi une surchauffe ou a été utilisé avec de l'air contaminé par le chlore, le fluor ou d'autres produits chimiques nuisibles. La surchauffe peut être établie, sans s'y limiter, par la déformation des plaques ou tubes, la couleur rouille de la fonte, l'apparition de bulles et de craquelures, et la décoloration des surfaces en acier ou émaillées.
- L'appareil est soumis à l'humidité ou à la condensation pendant de longues périodes.
- Les dommages causés à l'appareil ou aux autres composants par l'eau ou les intempéries en raison, entre autres, d'une mauvaise installation de la cheminée ou du conduit d'évacuation.

RESTRICTIONS DE LA GARANTIE

Le seul recours du propriétaire et la seule obligation de USSC en vertu de cette garantie ou de toute autre garantie, explicite ou tacite, contractuelle, à tort ou à raison, sont limités au remplacement, à la réparation ou au remboursement. En aucun cas, USSC ne saurait être tenue responsable des dommages fortuits ou consécutifs. LA GARANTIE LIMITÉE INCLUSE AUX PRÉSENTE EST LA SEULE DISPONIBLE POUR L'ACHETEUR, TENANT LIEU DE TOUTES AUTRES GARANTIES OU DÉCLARATIONS, FORMELLE OU TACITE. USSC NE FAIT AUCUNE DÉCLARATION OU GARANTIE DE TOUTE SORTE, QU'ELLE SOIT TACITE OU FORMELLE, RELATIVEMENT AU PRODUIT, AUTRE QUE (i) LA GARANTIE LIMITÉE MENTIONNÉE CI-DESSUS, ET (ii) TOUTE GARANTIE TACITE IMPOSÉE PAR LE DROIT APPLICABLE PAR LAQUELLE ELLE NE PEUT ÊTRE ANNULÉE OU DÉCLINÉE SELON LE DROIT APPLICABLE. TOUTES AUTRES GARANTIES DE TOUT GENRE, INCLUANT, MAIS SANS S'Y LIMITER, AUX GARANTIES TACITES DE QUALITÉ MARCHANDE OU D'APTITUDE À L'EMPLOI, SONT DONC AUX PRÉSENTES, DÉCLINÉES ET EXCLUES JUSQU'À LA LIMITE DU DROIT APPLICABLE. Cette garantie limitée confère à l'acheteur des droits juridiques spécifiques; les droits de l'acheteur pourraient différer selon son lieu de résidence. Certains États ne permettent pas l'exclusion ou la limitation de dommages particuliers, accessoires ou indirects, ou des lois d'État peuvent avoir un impact sur la durée des limitations; ainsi, l'exclusion et les limitations précédentes pourraient ne pas s'appliquer.

GARANT

Le garant de ce dossier est United States Stove Company, PO Box 151, 227 Industrial Park Road, South Pittsburg, Tennessee 37380. Numéro de téléphone : (800)-750-2723. Enregistrez votre produit en ligne au www.usstove.com. Conservez votre preuve d'achat, documentée sous forme de facture ou de reçu, en cas de réclamation.

IMPORTANT

Félicitation d'avoir choisi United States Stove Company et ses produits. Étant le plus ancien fabricant de combustible solide aux États-Unis (depuis 1869), United States Stove Company est fière de ses produits, son service, ses employés, et ses clients satisfaits. Nous aimerions le savoir si vous êtes insatisfait de la façon dont vous aurait répondu l'un de nos distributeurs, détaillants, représentants, service à la clientèle, service des pièces ou service des ventes. Veuillez nous joindre en utilisant l'un des moyens pour nous contacter indiqués ci-dessous.

Appendix C: Calibrations

Established 1974

QUALITY CONTROL SERVICES

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A2LA ACCREDITED
CERTIFICATE #1550.01

PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI01A05026181218

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Rice Lake	IQ+355E-2A x 100(	A05026	#041	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.1	QC033	12/18/18	6/13/18	12/2019

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 250 Tol: 1	Test Wt: HB44 Tol: HB44	Test Wt: 100 Tol: 1	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 16.9°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	999.3	1000.2	0.12
700	699.7	700.1	0.12
500	499.7	500.1	0.08
300	299.8	300.1	0.08
100	99.9	100.0	0.05
50	50.0	50.0	0.05

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	11/24/17	11/2019	20172265

Permanent Information Concerning this Equipment:
12 month calibration cycle. 2000lb platform.

Comments/Information Concerning this Calibration
12/18 - RH = 67%. Adjusted span.

Report prepared/reviewed by: ServiceTechDC **Date:** 12/28/18 **Technician:** R.Kauble **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:	12/17/2018
Calibration Expiration:	6/17/2019
Barometric Pressure:	29.87 in. Hg

PFS·TECO

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/5/2019
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	12/13/2018
γ Factor:	1.002
Allowable Deviation (±5%):	0.0501
Actual Deviation:	0.00
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)	166.180	147.027	169.354
Standard DGM Temperature (°F)	71.7	72.5	73.0
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)	5.950	5.296	6.132
DGM Temperature (°F)	83.0	91.0	93.0
DGM Pressure (in H_2O)	2.60	2.00	1.5
Time (min)	37.0	37.0	49.0
Net Volume for Standard DGM (ft^3)	5.869	5.192	5.981
Net Volume for DGM (ft^3)	5.950	5.296	6.132
Dry Gas Meter γ Factor	0.999	1.007	1.006
γ Factor Deviation From Average	0.999	1.007	1.006

Average Gas Meter γ Factor: 1.004

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%.

Technician: _____ 12/17/2018

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-60-ED
Lab ID #:	54
Serial #:	1902133
Calibration Date:	12/17/2018
Calibration Expiration:	6/17/2019
Barometric Pressure:	29.87 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/5/2019
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	12/13/2018
γ Factor:	0.997
Allowable Deviation (±5%):	0.04985
Actual Deviation:	0.00
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)	153.596	138.287	193.022
Standard DGM Temperature (°F)	73.0	73.0	74.0
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)	5.594	5.047	7.058
DGM Temperature (°F)	94.5	95.0	96.0
DGM Pressure (in H_2O)	2.60	2.00	1.5
Time (min)	35.0	36.0	57.0
Net Volume for Standard DGM (ft^3)	5.424	4.884	6.816
Net Volume for DGM (ft^3)	5.594	5.047	7.058
Dry Gas Meter γ Factor	1.000	1.001	1.000
γ Factor Deviation From Average	1.000	1.001	1.000

Average Gas Meter γ Factor: 1.000

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%.

Technician: 12/17/2018

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	Apex-AK-600
Lab ID #:	055
Serial #:	810016
Calibration Date:	6/15/2018
Calibration Expiration:	6/15/2019
Barometric Pressure:	29.83 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	047
Serial #:	1101001
Calibration Expiration Date:	3/5/2019
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	1/18/2017
γ Factor:	0.997
Allowable Deviation (±5%):	0.04985
Actual Deviation:	0.00
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)	145.479	148.058	143.802
Standard DGM Temperature (°F)	71.0	71.0	71.0
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)	5.146	5.254	5.114
DGM Temperature (°F)	75.0	76.5	77.5
DGM Pressure (in H_2O)	1.80	1.80	1.8
Time (min)			
Net Volume for Standard DGM (ft^3)	5.138	5.229	5.078
Net Volume for DGM (ft^3)	5.146	5.254	5.114

Dry Gas Meter γ Factor	0.999	0.999	0.999
γ Factor Deviation From Average	0.999	0.999	0.999

Average Gas Meter γ Factor: 0.999

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%.

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

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: DIRI0134307497190610

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Sartorius	ENTRIS224-1S	34307497	#107	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
g	0.0001	QC012	6/10/19	12/18/18	12/2019

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. 99.9999	5. 100.0000	9. 100.0000
2. 99.9999	6. 100.0000	10. 100.0000
3. 99.9999	7. 99.9999	**Result**
4. 99.9999	8. 100.0000	0.00005

ENVIRONMENTAL CONDITIONS
☐ Good ☑ Fair ☐ Poor
Temperature: 20.4°C

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9986	200.0000	0.00015
100	99.9996	99.9999	0.00015
50	49.9998	50.0000	0.00015
20	19.9999	20.0000	0.00015
1	1.0000	1.0000	0.00015
0.1	0.1000	0.1000	0.00015

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	R.L./Troemner	10kg to 1mg	G782	1/25/19	1/2020	20190189

Permanent Information Concerning this Equipment:
6 month calibration cycle.

Comments/Info Concerning this Calibration:
6/19 RH= 55%. Adjusted span.

Report prepared/reviewed by: ServiceTechJC **Date:** 6/11/19

Technician: R.Kauble Signed Jake 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 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.

DICK MUNNS COMPANY
LIQUID & GAS FLOW CALIBRATION

ISO 17025 IAS ACCREDITED
CL-122

CERTIFICATE OF CALIBRATION

CUSTOMER:	**PFS-TECO :** CLACKAMAS, OR	**CALIBRATION DATE:**	03/14/2019
PO NUMBER:	N/A	**CALIBRATION DUE:**	03/14/2020
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:**	762 mm HGA 43% RH 69°F
UNCERTAINTY GIVEN:	± .20% RD ; k=2	**CERTIFICATE FILE #:**	490265.2019

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
64	65	0 TO 200°F	0 TO 200°F
110	112	43.4	43.5
206	210	69.0	68.9
498	509	99.4	99.2
503	505		
1049	1058		
1497	1514		
509	513		
3419	3460		
4992	5068		
5136	5235		
13928	14232		

STANDARDS USED:		
A220: 12" WIND TUNNEL 0 - 8000 FPM | CMC ± .203% RD | TRACE# 1520423238	DUE	05/23/2019
A24: HART SCIENTIFIC TEMP. STANDARD | ±.024 F | TRACE# 1520423238	DUE	03/07/2020

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: 3/14/2019

Approved By:

Calibration Technician:

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

PRAXAIR
Making our planet more productive

DocNumber: 225861

Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22018

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062

Certificate Modification Date: 10/01/2018
Praxair Order Number: 70743165
Part Number: NI CD17CO8E-AS

Fill Date: 09/26/2018
Lot Number: 70086826911
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 1290 psig 140 ft3

Certified Concentration

ProSpec EZ Cert

Expiration Date:	10/01/2026	NIST Traceable
Cylinder Number:	SA17187	Expanded Uncertainty
17.00 %	Carbon dioxide	± 0.3 %
4.31 %	Carbon monoxide	± 0.6 %
16.99 %	Oxygen	± 0.2 %
Balance	Nitrogen	

Certification Information:

Certification Date: 10/01/2018 *Term:* 96 Months *Expiration Date:* 10/01/2026

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
Do Not Use this Standard if Pressure is less than 100 PSIG.
CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. ***Component:*** **Carbon dioxide**

Requested Concentration: 17 %
Certified Concentration: 17.00 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 09/21/2018

First Analysis Data: **Date** 10/01/2018

Z:	0	R:	20.1	C:	17	Conc:	17
R:	20.1	Z:	0	C:	17	Conc:	17
Z:	0	C:	17.01	R:	20.11	Conc:	17.01

UOM: % **Mean Test Assay:** 17 %

Reference Standard: Type / Cylinder #: GMIS / CC187238
Concentration / Uncertainty: 20.10 % ±0.24%
Expiration Date: 06/07/2026
Traceable to: SRM # / Sample # / Cylinder #: RGM#CC193512 / N/A / RGM#CC193512
SRM Concentration / Uncertainty: 26.99% / ±0.05%
SRM Expiration Date: 05/15/2023

Second Analysis Data: **Date**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** %

2. ***Component:*** **Carbon monoxide**

Requested Concentration: 4.25 %
Certified Concentration: 4.31 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 09/21/2018

First Analysis Data: **Date** 10/01/2018

Z:	0	R:	5	C:	4.31	Conc:	4.31
R:	5	Z:	0	C:	4.3	Conc:	4.3
Z:	0	C:	4.32	R:	5.01	Conc:	4.32

UOM: % **Mean Test Assay:** 4.31 %

Reference Standard: Type / Cylinder #: GMIS / CC242633
Concentration / Uncertainty: 5.00 % ±0.543%
Expiration Date: 04/03/2025
Traceable to: SRM # / Sample # / Cylinder #: SRM 2642a / 51-D-23 / FF23106
SRM Concentration / Uncertainty: 7.859% / ±0.039%
SRM Expiration Date: 07/15/2019

Second Analysis Data: **Date**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** %

3. ***Component:*** **Oxygen**

Requested Concentration: 17 %
Certified Concentration: 16.99 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 09/04/2018

First Analysis Data: **Date** 10/01/2018

Z:	0	R:	20.86	C:	16.99	Conc:	16.99
R:	20.86	Z:	0	C:	16.99	Conc:	16.99
Z:	0	C:	16.99	R:	20.86	Conc:	16.99

UOM: % **Mean Test Assay:** 16.99 %

Reference Standard: Type / Cylinder #: GMIS / CC75874
Concentration / Uncertainty: 20.86 % ±0.111%
Expiration Date: 11/07/2025
Traceable to: SRM # / Sample # / Cylinder #: SRM 2659a / 71-E-19 / FF22331
SRM Concentration / Uncertainty: 20.863% / ±0.021%
SRM Expiration Date: 08/23/2021

Second Analysis Data: **Date**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** %

Analyzed By **Jose Vasquez**

Certified By **Danielle Burns**

PRAXAIR
Making our planet more productive

DocNumber: 223791

Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22018

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062

Certificate Modification Date: 09/05/2018
Praxair Order Number: 70716136
Part Number: NI CD10CO33E-AS

Fill Date: 08/31/2018
Lot Number: 70086824308
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

ProSpec EZ Cert

Expiration Date:	09/05/2026	NIST Traceable
Cylinder Number:	CC170624	Expanded Uncertainty
10.00 %	Carbon dioxide	± 0.3 %
2.51 %	Carbon monoxide	± 0.7 %
10.50 %	Oxygen	± 0.6 %
Balance	Nitrogen	

Certification Information:

Certification Date: 09/05/2018 *Term:* 96 Months *Expiration Date:* 09/05/2026

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.

Do Not Use this Standard if Pressure is less than 100 PSIG.

CO responses have been corrected for CO2 interference. CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. ***Component:*** **Carbon dioxide**

Requested Concentration: 10 %
Certified Concentration: 10.00 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 08/20/2018

First Analysis Data: **Date** 09/05/2018

Z:	0	R:	14.02	C:	10	Conc:	10
R:	14.02	Z:	0	C:	10	Conc:	10
Z:	0	C:	10	R:	14.02	Conc:	10

UOM: % **Mean Test Assay:** 10 %

Reference Standard: Type / Cylinder #: GMIS / CC141375
Concentration / Uncertainty: 14.02 % ±0.3%
Expiration Date: 06/11/2026
Traceable to: SRM # / Sample # / Cylinder #: SRM 1675b / 6-F-51 / CAL014538
SRM Concentration / Uncertainty: 13.963% / ±0.034%
SRM Expiration Date: 05/16/2022

Second Analysis Data: **Date**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** %

2. ***Component:*** **Carbon monoxide**

Requested Concentration: 2.5 %
Certified Concentration: 2.51 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 08/20/2018

First Analysis Data: **Date** 09/05/2018

Z:	0	R:	2.48	C:	2.51	Conc:	2.51
R:	2.48	Z:	0	C:	2.51	Conc:	2.51
Z:	0	C:	2.51	R:	2.48	Conc:	2.51

UOM: % **Mean Test Assay:** 2.51 %

Reference Standard: Type / Cylinder #: GMIS / CC102045
Concentration / Uncertainty: 2.48 % ±0.448%
Expiration Date: 04/03/2025
Traceable to: SRM # / Sample # / Cylinder #: SRM 2641a / 52-D-30 / CAL017193
SRM Concentration / Uncertainty: 4.009% / ±0.017%
SRM Expiration Date: 07/15/2019

Second Analysis Data: **Date**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** %

3. ***Component:*** **Oxygen**

Requested Concentration: 10.5 %
Certified Concentration: 10.50 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 09/04/2018

First Analysis Data: **Date** 09/05/2018

Z:	0	R:	9.88	C:	10.49	Conc:	10.49
R:	9.88	Z:	0	C:	10.5	Conc:	10.5
Z:	0	C:	10.5	R:	9.88	Conc:	10.5

UOM: % **Mean Test Assay:** 10.5 %

Reference Standard: Type / Cylinder #: NTRM / DT0010402
Concentration / Uncertainty: 9.88 % ±0.4%
Expiration Date: 11/18/2022
Traceable to: SRM # / Sample # / Cylinder #: NTRM #170701 / N/A / NTRM #DT0010402
SRM Concentration / Uncertainty: 9.875% / ±0.040%
SRM Expiration Date: 11/18/2022

Second Analysis Data: **Date**

Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

UOM: % **Mean Test Assay:** %

Analyzed By: **Danielle Burns**

Certified By: **Jose Vasquez**

ACCREDITED
A2LA Certificate No. 1750.01
Calibration

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

Cert. No.: 4198-9765787

Traceable® Certificate of Calibration for Hand Held Barometer

Customer :PFS TECO Suite 305 ,11785 SE Highway 212 ,Clackamas ,OR-97015 ,U.S.A.

Instrument Identification:

Model: 4198, S/N: 80531676 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Barometer	D4540001	09 Oct 2018	1000415948
Digital Thermometer	111879345	09 Apr 2019	4000-9377595

Certificate Information:

Technician: 57 Procedure: CAL-32 Cal Date: 29 Aug 2018 Cal Due Date: 29 Aug 2019

Test Conditions: 62.73%RH 23.92°C 1018mBar

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C	24.10	24.1	Y	23.51	23.9	Y	22.01	25.01	0.05	>4:1
mb/hPa	551.55	552	Y	551.62	546	Y	544	560	0.62	>4:1
mb/hPa	751.22	744	Y	748.87	746	Y	741	757	0.62	>4:1
mb/hPa	1015.90	1011	Y	1018.22	1017	Y	1010	1026	0.62	>4:1

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement : (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ± U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min=As Left Nominal(Rounded) – Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

Nicol Rodriguez

Nicol Rodriguez, Quality Manager

Aaron Judice

Aaron Judice. Technical Manager

Note :

Maintaining Accuracy:

In our opinion once calibrated your Hand Held Barometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Hand Held Barometer change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.control3.com

Control Company is an ISO/IEC 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2008 Quality Certified by DNV GL, Certificate No. CERT-01805-2006-AQ-HOU-RvA.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

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

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

0723.01
Calibration

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
Before/After							Accredited = ✓
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