United States Stove Company

Project # 22-753
Model: KP5522
Additional Models: KP5522-P, KP5522-L, KP5522-W, US5522, US5522-P, US5522-L, US5522-W, AP5622, AP5622-P, AP5622-L, AP5622-W VG5722, VG5722-P, VG5722-L, VG5722-W, SP1100, SP1100-W, KP130-B
Type: Pellet-Fired Room Heater
March 29, 2022
Revised Date: May 17, 2022, November 21, 2022

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

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

Prepared by: Sebastian Button,
Laboratory Supervisor

PFS·TECO

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

Revision History

Date: March 29, 2022 – Original Issue

Date: May 17, 2022 – The following changes were made per request from EPA:

- B415 Calculations page was included in Appendix A, see page 73 of Non-CBI report.
- Adjusted CO emissions values on page 8 to show 2 significant figures.

November 21, 2022

- Added model KP130 -B the Certificate of Conformity and the report.

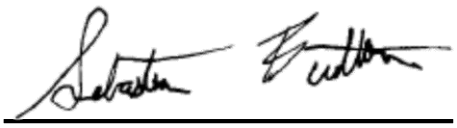
Contents

Affidavit

PFS-TECO was contracted by United States Stove Company to provide testing services for the KP5522 Pellet-Fired Room Heater per EPA ALT-146, using ASTM E2779, *Determining PM Emissions from Pellet Heaters*. All testing and associated procedures were conducted at PFS-TECO's Portland Laboratory on 2/18/2022. PFS-TECO's Portland Laboratory is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 97015. Testing procedures followed EPA ALT-146 / ASTM E2779. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel.*

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

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



Sebastian Button, Laboratory Supervisor

Introduction

United States Stove Company of South Pittsburg, TN, contracted with PFS-TECO to perform EPA certification testing on KP5522 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 US Stove personnel at a medium burn setting per ASTM E2779
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- 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:
    - 1 Hour at Maximum Burn Setting
    - 2 Hours at Medium Burn Setting (in accordance with ALT-146)
    - 3 Hours at Minimum Burn Setting

Pellet Heater Identification and Testing

- Appliance Tested: ***KP5522***
- Serial Number: ***un-serialized prototype, PFS tracking #121***
- Manufacturer*:* ***United States Stove Company***
- Catalyst: ***No***
- Heat exchange blower: ***Integral***
- Type: ***Pellet Stove***
- Style: ***Free Standing***
- Date Received: ***Monday, February 14, 2022***
- Testing Period – Start: ***Friday, February 18, 2022*** Finish: ***Friday, February 18, 2022***
- 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
190	Mettler Toledo 3'x3' floor scale w/digital weight indicator
129	APEX XC-50-DIR Digital Emissions Sampling Box A
130	APEX XC-50-DIR Digital Emissions Sampling Box B
055	APEX Ambient sampling box
187	California Analytical ZRE CO2/CO/O2 IR ANALYZER
064	Digital Barometer
109A/B	Troemner 100mg/200mg Audit Weights
107	Sartorius Analytical Balance
097	10 lb audit weight
095	Anemometer
111	Microtector
CC106574	Gas Analyzer Calibration Span Gas
CC139173	Gas Analyzer Calibration Mid Gas

Results

The integrated test run emission rate for test Run 1 was measured to be **1.5 g/hr** with a Higher Heating Values efficiency of **76%** and a CO emission rate of **0.15 g/min**. The calculated first hour particulate emission rate was **2.8 g/hr**. The United States Stove Company Model KP5522 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	2/18/2022	H	2.26	60	32591	2.8	1.5	0.21	0.15	77%	76%
		M	1.58	120	22312			0.17		76%	
		L	0.97	180	13640			0.12		76%	
		OA	1.39	360	19708			0.15		76%	

Test Run Narrative

Run 1

Run 1 was performed on 2/18/2022 as an attempted integrated test run per EPA ALT-146/ ASTM E2779. The overall test duration was 360 minutes. The particulate emissions rate for the integrated test run was 1.5 g/hr. The run had an overall HHV efficiency of 76%. Sample train A was changed at 1 hr. All test results were appropriate and valid and the burn rate requirements for the integrated test run were achieved. There were no anomalies and all criteria were met.

Test Conditions Summary

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

Runs	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	69	69	26.2	23.4	30.47	5.4	19.2	4.37	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 #3 Low Segment: Heat Setting #1

Appliance Description

Model(s): KP5522

Additional Models Discussion: This model is offered under a variety of different branding designations under the following model numbers: KP5522-P, KP5522-L, KP5522-W, US5522, US5522-P, US5522-L, US5522-W, AP5622, AP5622-P, AP5622-L, AP5622-W VG5722, VG5722-P, VG5722-L, VG5722-W, SP1100, and SP1100-W. The various models are identical in all aspects with the exception of the brand names.

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, with an optional adapter piece to convert to 6-inch venting.

Appliance Dimensions

KP5522 Dimensions

Height	Width	Depth
40”	24”	30”

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 Bear Mountain Wood Pellet Fuel, a PFI Certified Premium Pellet Brand. A sample of pellets was sent to Twin Ports Testing for analysis, see report below.

Pellet Fuel Analysis

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

Twin Ports Testing

Analytical Test Report

Report No: USR:W222-0106-01
Issue No: 1

Client: PFS-TECO
11785 SE Hwy 212 Ste 305
Clackamas, OR 97015
Attention: Sebastian Button
PO No:

Signed:
Amber Anderson
Chemist
Date of Issue: 3/9/2022

Sample Details

Sample Log No:	W222-0106-01	**Sample Date:**	
Sample Designation:	Lignetics Hardwood	**Sample Time:**	
Sample Recognized As:	Wood Pellets	**Arrival Date:**	2/23/2022

Test Results

	METHOD	UNITS	MOISTURE FREE	AS RECEIVED
Moisture Total	ASTM E871	wt. %		4.19
Ash	ASTM D1102	wt. %	0.57	0.55
Volatile Matter	ASTM D3175	wt. %		
Fixed Carbon by Difference	ASTM D3172	wt. %		
Sulfur	ASTM D4239	wt. %	0.125	0.120
SO_2	Calculated	lb/mmbtu		0.297
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	17.79	16.95
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8449	8095
Carbon	ASTM D5373	wt. %	46.54	44.59
Hydrogen*	ASTM D5373	wt. %	8.59	8.23
Nitrogen	ASTM D5373	wt. %	< 0.20	< 0.20
Oxygen*	ASTM D3176	wt. %	> 43.98	> 42.13
*Note: As received values do not include hydrogen and oxygen in the total moisture.				
Chlorine	ASTM D6721	mg/kg		
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft^3		
Fines (Less than 1/8")	TPT CH-P-06	wt.%		
Durability Index	Kansas State	PDI		
Sample Above 1.50"	TPT CH-P-06	wt.%		
Maximum Length (Single Pellet)	TPT CH-P-06	inch		
Diameter, Range	TPT CH-P-05	inch		to
Diameter, Average	TPT CH-P-05	inch		
Stated Bag Weight	TPT CH-P-01	lbs		
Actual Bag Weight	TPT CH-P-01	lbs		

Comments:

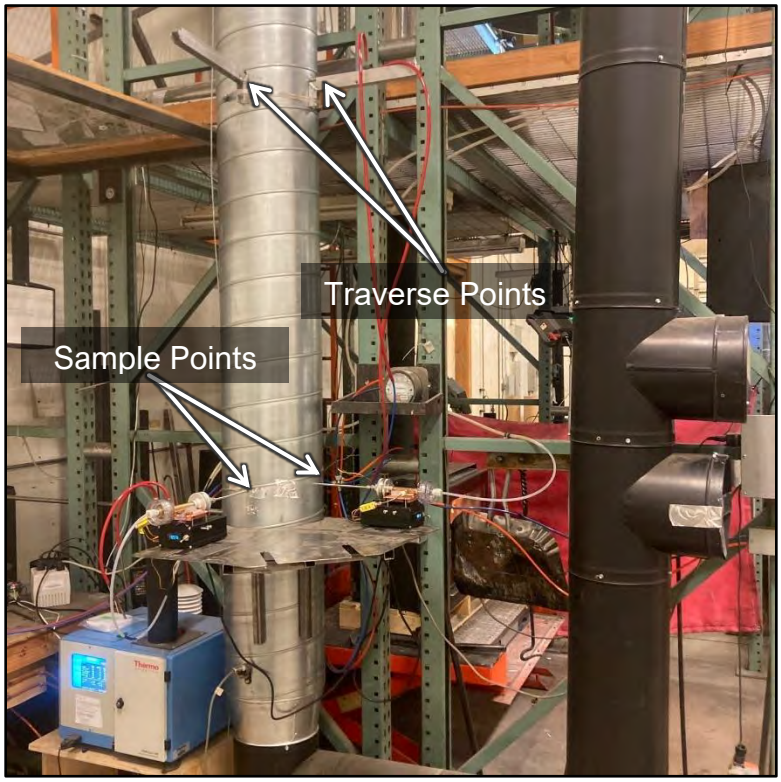
ilac-MRA

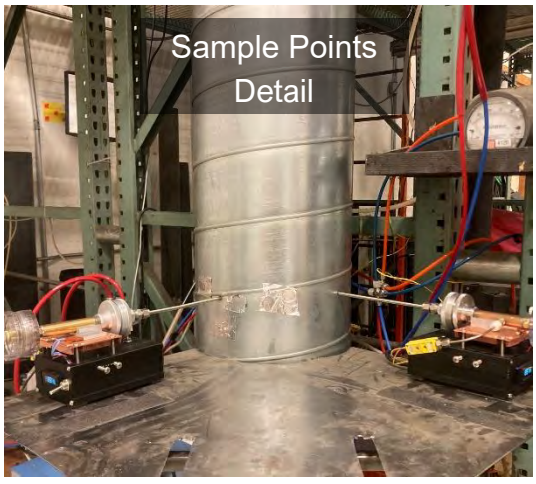
PJLA Testing
Accreditation #60243

Sampling Location and Descriptions

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

Photos





Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel is 12 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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

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

02/04/2022

Dear Mr. Steinert,

I am writing you in response to your correspondence dated February 3, 2022, in which you request the use of an alternative testing procedure to demonstrate compliance with 40 CFR part 60, Subpart AAA – Standards of Performance for New Residential Wood Heaters (Subpart AAA). The Office of Air Quality Planning and Standards, as the delegated authority, must make the determination on any major alternatives to test methods and procedures required under 40 CFR parts 59, 60, 61, 63, and 65. Your proposed alternative test method and our approval decisions are discussed below.

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

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

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

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

Based on the information provided and with the caveats set forth below, we are approving your request for an alternative methodology used when calculating the Medium Burn Rate Category to conduct certification testing as required by Subpart AAA, section 60.534(a)(1)(i) on pellet heaters. This approval is based on the understanding that the Medium Burn Rate Category is defined as less than 50% of the span between the high and low burn rates. Additionally, this approval is based on the understanding that the lowest heat output (Btu/hr) setting available to the user, and corresponds to the lowest burn rate to be evaluated during certification testing; this is consistent with Subpart AAA, section 60.534(a)(1), which states: "The burn rate for the low burn category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer."

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

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

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

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

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

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

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

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

Sincerely,

Steffan M Johnson

Steffan M. Johnson
Group Leader
Measurement Technology Group

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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

02/02/2022

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

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

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

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

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

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

TABLE 1

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

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

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

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

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

Manufacturer:	USSC
Model:	KP5522
Date:	02/18/22
Run:	1
Control #:	22-753
Test Duration:	360 min

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

	HHV	LHV
Eff	76.24%	84.18%
Comb Eff	99.50%	99.50%
HT Eff	76.63%	84.61%
Output	20,775	kJ/h
Burn Rate	1.39	kg/h
Grams CO	55	g
Input	27,248	kJ/h
MC wet	4.19	

Overall Heating Efficiency:	76.24%
Combustion Efficiency:	99.50%
Heat Transfer Efficiency:	76.63%

Air Fuel Ratio (A/F)	
Dry Molecular Weight (M_d)	29.41
Dry Moles Exhaust Gas (N_t):	843.31
Air Fuel Ratio (A/F)	24.29

%HC 0.8

Heat Output:	19,708 Btu/h	20,775 kJ/h
Heat Input:	25,848 Btu/h	27,248 kJ/h

Ultimate CO_2

$CO_{2\text{-ult}}$ 18.14

F_0 1.146

Burn Duration:	6.00	h	
Burn Rate:	3.06	lb/h	1.387 kg/h
Stack Temp:	250.3	Deg. F	121.3 Deg. C

Averages		**0.03**	**5.01**	**2.99**	**20.16**	**15.14**	**121.36**	**20.17**	**100.6%**	**76.7%**	**77.2%**	**25.08**	**3.58**	**58.85**	**3.48**	**58.24**
INPUT DATA				**Oxygen Calculation**			**Input Data**		**Combust**	**Heat**	**Net**	**Air**	**Wet Wt**	**% Wet**	**Dry Wt.**	**% Dry**
Elapsed	**Weight**	**%**	**%**	**Excess**	**Total**	**Calc. %**	**Flue**	**Room**	**Eff**	**Transfer**	**Eff**	**Fuel**	**Now**	**Consumed**	**Now**	**Comsumed**
Time	**Remaining (kg)**	**CO [e]**	**CO_2 [d]**	**Air EA**	**O_2**	**O_2 [g]**	**Gas (°C)**	**Temp (°C)**	**%**	**%**	**%**	**Ratio**	**Wt**	**x**	**Wt_{dn}**	**y**
0	8.69	0.05	8.64	108.8%	19.60	10.94	159.3	20.3	99.9%	79.1%	79.0%	13.2	8.69	0.00	8.32	0.00
1	8.65	0.03	7.37	145.0%	19.80	12.41	159.3	20.3	100.2%	77.5%	77.6%	15.5	8.65	0.42	8.29	0.42
2	8.62	0.05	8.11	122.3%	19.68	11.54	158.8	20.3	99.9%	78.5%	78.5%	14.0	8.62	0.84	8.26	0.84
3	8.57	0.04	7.29	147.5%	19.81	12.50	158.3	20.3	100.1%	77.5%	77.5%	15.6	8.57	1.41	8.21	1.41
4	8.53	0.04	7.49	141.0%	19.78	12.27	158.7	20.2	100.1%	77.7%	77.8%	15.2	8.53	1.88	8.17	1.88
5	8.50	0.03	6.71	169.0%	19.90	13.17	158.4	20.4	100.3%	76.5%	76.7%	16.9	8.50	2.19	8.14	2.19
6	8.45	0.03	7.43	143.2%	19.79	12.34	157.9	20.4	100.2%	77.7%	77.9%	15.3	8.45	2.77	8.09	2.77
7	8.42	0.03	6.81	165.2%	19.89	13.06	156.9	20.4	100.2%	76.8%	77.0%	16.7	8.42	3.13	8.06	3.13
8	8.38	0.03	7.01	157.6%	19.85	12.83	156.8	20.4	100.2%	77.2%	77.4%	16.2	8.38	3.50	8.03	3.50
9	8.35	0.03	7.46	142.1%	19.78	12.31	156.1	20.4	100.2%	77.9%	78.1%	15.3	8.35	3.92	8.00	3.92
10	8.30	0.04	8.87	103.6%	19.57	10.67	156.8	20.4	100.0%	79.5%	79.5%	12.9	8.30	4.49	7.95	4.49
11	8.26	0.07	9.41	91.4%	19.48	10.03	157.9	20.4	99.7%	79.9%	79.7%	12.1	8.26	4.96	7.91	4.96
12	8.20	0.04	7.62	137.0%	19.76	12.12	158.0	20.3	100.1%	78.0%	78.0%	14.9	8.20	5.59	7.86	5.59
13	8.17	0.03	7.81	131.3%	19.73	11.90	157.9	20.2	100.2%	78.2%	78.4%	14.6	8.17	6.01	7.82	6.01
14	8.13	0.05	9.03	99.8%	19.54	10.49	158.3	20.1	99.9%	79.5%	79.5%	12.6	8.13	6.48	7.79	6.48
15	8.10	0.04	6.49	178.1%	19.93	13.43	157.7	19.8	100.1%	76.1%	76.2%	17.5	8.10	6.74	7.76	6.74
16	8.06	0.03	7.69	135.0%	19.75	12.04	157.8	19.6	100.2%	78.0%	78.2%	14.8	8.06	7.26	7.72	7.26
17	8.01	0.03	7.69	135.1%	19.75	12.05	158.2	19.7	100.2%	78.0%	78.1%	14.8	8.01	7.78	7.68	7.78
18	7.99	0.04	6.95	159.6%	19.86	12.89	157.6	19.7	100.1%	76.9%	77.0%	16.4	7.99	8.09	7.65	8.09
19	7.95	0.03	6.98	158.7%	19.86	12.86	156.3	19.5	100.2%	77.1%	77.3%	16.3	7.95	8.51	7.62	8.51
20	7.89	0.05	7.94	127.2%	19.71	11.75	156.2	19.6	99.9%	78.5%	78.4%	14.3	7.89	9.14	7.56	9.14
21	7.86	0.03	6.74	168.1%	19.90	13.14	157.1	19.6	100.3%	76.6%	76.8%	16.9	7.86	9.56	7.53	9.56
22	7.83	0.04	7.23	149.6%	19.82	12.57	157.4	19.5	100.1%	77.4%	77.5%	15.7	7.83	9.87	7.50	9.87
23	7.79	0.03	7.17	151.8%	19.83	12.64	156.4	19.7	100.2%	77.4%	77.6%	15.9	7.79	10.29	7.47	10.29
24	7.77	0.04	7.26	148.5%	19.81	12.53	156.5	19.6	100.1%	77.5%	77.6%	15.7	7.77	10.60	7.44	10.60
25	7.70	0.03	7.52	140.3%	19.78	12.24	156.8	19.7	100.2%	77.9%	78.0%	15.2	7.70	11.33	7.38	11.33
26	7.68	0.03	7.33	146.4%	19.80	12.46	157.3	19.7	100.2%	77.6%	77.7%	15.5	7.68	11.64	7.36	11.64
27	7.64	0.03	7.12	153.9%	19.84	12.71	156.6	19.8	100.2%	77.3%	77.5%	16.0	7.64	12.06	7.32	12.06
28	7.60	0.04	7.49	141.0%	19.78	12.27	156.8	19.9	100.1%	77.9%	77.9%	15.2	7.60	12.58	7.28	12.58
29	7.55	0.05	8.68	107.9%	19.59	10.89	157.1	20.0	99.9%	79.3%	79.2%	13.1	7.55	13.11	7.23	13.11
30	7.51	0.04	7.50	140.7%	19.78	12.26	158.1	20.1	100.1%	77.8%	77.8%	15.2	7.51	13.58	7.19	13.58
31	7.48	0.04	7.66	135.7%	19.75	12.08	157.2	20.2	100.1%	78.1%	78.1%	14.9	7.48	13.94	7.16	13.94
32	7.43	0.04	8.26	118.6%	19.66	11.38	157.5	20.1	100.0%	78.8%	78.8%	13.8	7.43	14.46	7.12	14.46
33	7.40	0.03	8.01	125.7%	19.70	11.68	157.3	20.2	100.2%	78.5%	78.6%	14.2	7.40	14.78	7.09	14.78
34	7.35	0.03	7.36	145.6%	19.80	12.43	157.6	20.2	100.2%	77.6%	77.8%	15.5	7.35	15.46	7.04	15.46
35	7.30	0.04	7.96	126.7%	19.71	11.72	157.2	20.2	100.0%	78.5%	78.5%	14.3	7.30	15.93	7.00	15.93
36	7.28	0.06	9.17	96.6%	19.52	10.32	158.0	20.3	99.8%	79.7%	79.5%	12.4	7.28	16.24	6.97	16.24
37	7.22	0.06	9.14	97.2%	19.52	10.35	159.2	20.3	99.8%	79.6%	79.4%	12.5	7.22	16.87	6.92	16.87
38	7.19	0.05	7.80	131.1%	19.73	11.90	159.4	20.4	99.9%	78.1%	78.0%	14.6	7.19	17.28	6.89	17.28
39	7.15	0.03	7.57	138.8%	19.77	12.19	159.6	20.4	100.2%	77.8%	77.9%	15.1	7.15	17.75	6.85	17.75
40	7.11	0.04	7.47	141.7%	19.78	12.30	159.2	20.5	100.1%	77.7%	77.7%	15.2	7.11	18.17	6.81	18.17
41	7.06	0.04	7.56	138.7%	19.77	12.19	159.8	20.6	100.1%	77.7%	77.8%	15.0	7.06	18.75	6.76	18.75
42	7.03	0.03	7.38	145.0%	19.80	12.41	159.7	20.6	100.2%	77.5%	77.6%	15.4	7.03	19.11	6.73	19.11
43	6.99	0.03	7.44	143.0%	19.79	12.34	159.5	20.6	100.2%	77.6%	77.7%	15.3	6.99	19.53	6.70	19.53
44	6.95	0.04	8.16	121.2%	19.68	11.49	159.3	20.6	100.0%	78.6%	78.6%	14.0	6.95	20.00	6.73	19.20
45	6.90	0.04	7.06	155.6%	19.85	12.77	159.0	20.6	100.1%	77.1%	77.1%	16.1	6.90	20.57	6.68	19.76
46	6.87	0.04	7.07	155.1%	19.84	12.75	158.3	20.6	100.1%	77.2%	77.2%	16.1	6.87	20.94	6.65	20.12
47	6.83	0.04	6.27	187.4%	19.97	13.67	157.6	20.6	100.2%	75.8%	75.9%	18.1	6.83	21.41	6.61	20.58
48	6.81	0.04	7.31	146.9%	19.81	12.48	157.4	20.7	100.1%	77.6%	77.7%	15.6	6.81	21.67	6.59	20.84

49	6.75	0.03	7.72	134.1%	19.75	12.01	157.9	20.7	100.2%	78.1%	78.3%	14.8	6.75	22.30	6.54	21.45
50	6.71	0.03	7.41	143.9%	19.79	12.37	157.2	20.6	100.2%	77.8%	77.9%	15.4	6.71	22.82	6.50	21.96
51	6.67	0.03	6.90	161.9%	19.87	12.96	157.2	20.7	100.2%	77.0%	77.2%	16.5	6.67	23.19	6.47	22.32
52	6.64	0.03	7.61	137.6%	19.76	12.14	156.7	20.6	100.2%	78.1%	78.2%	15.0	6.64	23.55	6.44	22.67
53	6.60	0.03	7.11	154.1%	19.84	12.71	156.2	20.7	100.2%	77.4%	77.6%	16.0	6.60	24.02	6.40	23.14
54	6.56	0.04	7.82	130.7%	19.73	11.88	156.7	20.8	100.1%	78.4%	78.4%	14.6	6.56	24.49	6.36	23.60
55	6.52	0.03	8.09	123.4%	19.69	11.58	157.1	20.8	100.1%	78.7%	78.8%	14.1	6.52	25.01	6.32	24.11
56	6.47	0.03	7.60	137.7%	19.76	12.15	157.1	20.8	100.2%	78.1%	78.2%	15.0	6.47	25.54	6.28	24.62
57	6.43	0.06	8.63	108.7%	19.60	10.94	156.9	20.8	99.8%	79.3%	79.1%	13.2	6.43	25.95	6.24	25.03
58	6.40	0.05	8.43	113.9%	19.63	11.18	157.2	20.7	99.9%	79.0%	79.0%	13.5	6.40	26.37	6.21	25.44
59	6.36	0.04	7.02	157.2%	19.85	12.82	157.0	20.8	100.1%	77.2%	77.3%	16.2	6.36	26.79	6.17	25.85
60	6.32	0.03	7.53	140.0%	19.77	12.23	157.1	20.7	100.2%	78.0%	78.1%	15.1	6.32	27.21	6.14	26.26
61	6.30	0.07	8.79	104.7%	19.57	10.75	153.3	20.8	99.7%	79.7%	79.5%	12.9	6.30	27.47	6.12	26.52
62	6.27	0.03	5.55	225.3%	20.08	14.52	149.8	20.8	100.4%	75.1%	75.4%	20.5	6.27	27.78	6.09	26.83
63	6.26	0.03	5.82	210.2%	20.04	14.20	146.3	20.8	100.3%	76.1%	76.4%	19.5	6.26	27.99	6.07	27.04
64	6.22	0.04	6.50	177.3%	19.93	13.41	145.8	20.8	100.1%	77.4%	77.6%	17.5	6.22	28.41	6.04	27.45
65	6.19	0.05	7.03	156.1%	19.85	12.79	144.7	20.8	100.0%	78.4%	78.4%	16.1	6.19	28.72	6.01	27.76
66	6.16	0.04	6.07	196.7%	20.00	13.90	143.4	21.0	100.2%	76.9%	77.1%	18.7	6.16	29.09	5.98	28.12
67	6.14	0.03	5.36	236.5%	20.11	14.73	141.7	21.0	100.4%	75.6%	75.9%	21.2	6.14	29.35	5.96	28.37
68	6.12	0.02	4.77	278.6%	20.20	15.42	140.0	21.0	100.7%	74.3%	74.8%	23.8	6.12	29.56	5.95	28.58
69	6.09	0.04	5.92	204.4%	20.02	14.08	139.2	21.1	100.2%	77.1%	77.3%	19.2	6.09	29.92	5.92	28.94
70	6.06	0.03	4.51	299.7%	20.24	15.72	138.9	20.9	100.6%	73.6%	74.0%	25.1	6.06	30.23	5.89	29.25
71	6.03	0.02	5.20	247.5%	20.14	14.92	137.8	20.8	100.6%	75.7%	76.1%	21.9	6.03	30.55	5.86	29.56
72	6.01	0.05	6.98	158.0%	19.86	12.85	137.9	20.9	100.0%	78.9%	78.9%	16.3	6.01	30.86	5.84	29.87
73	5.98	0.03	5.35	237.4%	20.11	14.75	136.1	20.9	100.4%	76.3%	76.6%	21.2	5.98	31.12	5.82	30.13
74	5.95	0.04	5.82	209.8%	20.04	14.20	136.6	21.0	100.2%	77.2%	77.3%	19.5	5.95	31.49	5.79	30.49
75	5.93	0.03	6.07	197.5%	20.00	13.92	136.2	21.0	100.3%	77.7%	78.0%	18.7	5.93	31.80	5.76	30.80
76	5.89	0.04	6.44	179.8%	19.94	13.48	136.4	20.9	100.1%	78.3%	78.4%	17.6	5.89	32.17	5.73	31.16
77	5.87	0.03	5.21	246.5%	20.13	14.91	135.8	20.7	100.4%	75.9%	76.3%	21.8	5.87	32.43	5.71	31.42
78	5.84	0.03	5.11	252.7%	20.15	15.02	135.9	20.8	100.4%	75.7%	76.0%	22.2	5.84	32.79	5.68	31.78
79	5.82	0.04	4.63	288.9%	20.22	15.58	135.2	20.8	100.3%	74.4%	74.7%	24.4	5.82	33.05	5.66	32.04
80	5.79	0.04	6.72	168.4%	19.90	13.16	135.3	20.9	100.1%	78.8%	78.9%	16.9	5.79	33.37	5.63	32.35
81	5.76	0.04	5.68	217.4%	20.06	14.36	134.8	20.9	100.2%	77.1%	77.3%	20.0	5.76	33.68	5.61	32.66
82	5.73	0.03	6.28	187.3%	19.97	13.67	135.8	20.8	100.3%	78.1%	78.3%	18.1	5.73	34.05	5.58	33.02
83	5.70	0.03	5.80	211.4%	20.04	14.23	135.1	20.8	100.4%	77.3%	77.6%	19.6	5.70	34.36	5.55	33.33
84	5.68	0.03	5.73	215.1%	20.05	14.31	134.8	20.8	100.4%	77.2%	77.5%	19.8	5.68	34.67	5.52	33.64
85	5.65	0.03	6.08	197.0%	20.00	13.91	134.8	20.9	100.3%	77.9%	78.1%	18.7	5.65	34.93	5.50	33.90
86	5.62	0.05	6.36	183.1%	19.95	13.57	135.4	20.8	100.0%	78.3%	78.3%	17.8	5.62	35.30	5.47	34.27
87	5.59	0.05	5.65	218.3%	20.06	14.39	135.4	20.9	100.1%	77.0%	77.0%	20.0	5.59	35.61	5.45	34.58
88	5.57	0.03	5.50	228.1%	20.09	14.57	135.3	20.8	100.4%	76.7%	77.0%	20.6	5.57	35.93	5.42	34.89
89	5.54	0.03	4.74	280.3%	20.20	15.45	134.7	20.9	100.5%	74.9%	75.2%	23.9	5.54	36.24	5.39	35.20
90	5.51	0.04	5.65	218.8%	20.06	14.39	135.6	20.9	100.2%	77.0%	77.1%	20.1	5.51	36.61	5.36	35.56
91	5.48	0.03	5.64	219.9%	20.07	14.41	135.6	20.9	100.4%	77.0%	77.2%	20.1	5.48	36.97	5.33	35.93
92	5.45	0.04	6.51	177.0%	19.93	13.40	134.9	20.9	100.1%	78.6%	78.7%	17.4	5.45	37.28	5.31	36.24
93	5.42	0.03	5.83	209.9%	20.04	14.20	135.2	20.8	100.3%	77.4%	77.6%	19.5	5.42	37.60	5.28	36.55
94	5.39	0.04	6.25	188.3%	19.97	13.70	135.3	20.8	100.2%	78.1%	78.2%	18.1	5.39	37.96	5.25	36.91
95	5.37	0.04	6.02	199.2%	20.01	13.96	135.1	20.9	100.2%	77.7%	77.9%	18.8	5.37	38.22	5.23	37.17
96	5.34	0.03	4.52	299.2%	20.24	15.71	133.1	20.8	100.6%	74.4%	74.8%	25.1	5.34	38.49	5.21	37.43
97	5.31	0.02	5.46	231.0%	20.09	14.62	133.7	20.9	100.6%	76.8%	77.2%	20.8	5.31	38.85	5.18	37.80
98	5.29	0.03	5.40	234.1%	20.10	14.69	133.8	20.9	100.4%	76.6%	77.0%	21.0	5.29	39.16	5.15	38.11
99	5.25	0.02	5.28	242.4%	20.12	14.84	134.7	20.9	100.6%	76.3%	76.7%	21.6	5.25	39.53	5.12	38.47
100	5.23	0.03	6.86	163.4%	19.88	13.01	135.4	20.9	100.2%	79.0%	79.2%	16.6	5.23	39.84	5.10	38.79
101	5.20	0.04	4.63	288.5%	20.22	15.57	136.1	20.9	100.3%	74.4%	74.6%	24.4	5.20	40.21	5.07	39.15
102	5.16	0.04	6.64	171.5%	19.91	13.25	136.4	21.0	100.1%	78.6%	78.7%	17.1	5.16	40.57	5.04	39.52
103	5.14	0.03	5.99	201.5%	20.01	14.01	136.6	20.9	100.3%	77.5%	77.8%	19.0	5.14	40.89	5.01	39.83
104	5.11	0.03	4.70	283.7%	20.21	15.50	135.3	20.9	100.5%	74.7%	75.0%	24.1	5.11	41.15	4.99	40.09
105	5.08	0.03	5.12	252.4%	20.15	15.01	134.9	20.9	100.4%	75.8%	76.2%	22.2	5.08	41.51	4.96	40.45
106	5.06	0.02	5.16	250.6%	20.14	14.98	134.0	20.9	100.6%	76.1%	76.5%	22.1	5.06	41.78	4.94	40.71
107	5.03	0.06	6.50	176.8%	19.93	13.40	134.8	20.9	99.9%	78.5%	78.4%	17.4	5.03	42.14	4.90	41.08
108	5.00	0.03	5.16	249.4%	20.14	14.96	135.4	21.0	100.4%	75.9%	76.2%	22.0	5.00	42.45	4.88	41.39
109	4.97	0.03	5.70	216.6%	20.06	14.34	134.8	21.1	100.4%	77.2%	77.5%	19.9	4.97	42.82	4.85	41.76
110	4.95	0.03	5.72	215.7%	20.05	14.32	134.9	21.0	100.4%	77.2%	77.5%	19.9	4.95	43.08	4.83	42.02
111	4.92	0.06	6.32	184.4%	19.96	13.61	135.4	20.9	99.9%	78.2%	78.1%	17.9	4.92	43.39	4.80	42.33
112	4.89	0.03	4.85	271.6%	20.19	15.32	133.8	21.1	100.5%	75.3%	75.7%	23.4	4.89	43.71	4.77	42.65
113	4.86	0.04	6.22	189.8%	19.97	13.73	134.7	21.1	100.2%	78.1%	78.3%	18.2	4.86	44.02	4.75	42.96
114	4.84	0.03	4.84	272.8%	20.19	15.34	134.0	21.1	100.5%	75.2%	75.6%	23.5	4.84	44.33	4.72	43.27
115	4.81	0.05	5.89	205.3%	20.02	14.11	133.7	21.2	100.0%	77.7%	77.7%	19.2	4.81	44.60	4.70	43.54
116	4.79	0.02	4.56	296.5%	20.23	15.67	133.6	21.0	100.7%	74.5%	75.0%	24.9	4.79	44.86	4.68	43.80
117	4.77	0.02	5.03	259.5%	20.16	15.12	132.8	21.0	100.6%	75.9%	76.4%	22.6	4.77	45.12	4.66	44.06
118	4.74	0.04	5.64	219.6%	20.06	14.41	132.8	21.1	100.2%	77.3%	77.4%	20.1	4.74	45.48	4.63	44.42

119	4.71	0.03	4.61	290.9%	20.22	15.60	131.8	21.1	100.5%	74.9%	75.3%	24.6	4.71	45.74	4.60	44.69
120	4.69	0.03	5.10	254.0%	20.15	15.04	131.6	21.1	100.5%	76.2%	76.6%	22.3	4.69	46.01	4.58	44.95
121	4.66	0.03	4.03	347.2%	20.31	16.27	131.4	21.1	100.7%	73.0%	73.5%	28.1	4.66	46.37	4.55	45.31
122	4.63	0.03	5.51	227.5%	20.09	14.56	131.8	21.1	100.4%	77.1%	77.4%	20.6	4.63	46.68	4.53	45.63
123	4.61	0.03	4.53	298.3%	20.24	15.70	130.5	21.0	100.6%	74.8%	75.2%	25.0	4.61	46.95	4.50	45.89
124	4.58	0.03	4.81	275.2%	20.19	15.37	130.8	21.1	100.5%	75.6%	76.0%	23.6	4.58	47.26	4.48	46.21
125	4.56	0.03	4.91	267.0%	20.18	15.25	129.9	21.0	100.5%	76.0%	76.3%	23.1	4.56	47.47	4.46	46.42
126	4.53	0.04	6.17	192.2%	19.98	13.79	132.1	21.1	100.2%	78.3%	78.4%	18.4	4.53	47.89	4.43	46.83
127	4.49	0.04	6.60	173.1%	19.92	13.29	133.4	20.9	100.1%	78.9%	79.0%	17.2	4.49	48.30	4.39	47.25
128	4.46	0.03	5.45	231.3%	20.10	14.63	133.3	20.8	100.4%	76.8%	77.1%	20.8	4.46	48.62	4.36	47.57
129	4.44	0.03	4.47	303.1%	20.25	15.76	133.1	20.8	100.6%	74.2%	74.7%	25.3	4.44	48.88	4.34	47.83
130	4.42	0.03	6.15	193.5%	19.99	13.82	132.6	20.7	100.3%	78.2%	78.4%	18.5	4.42	49.14	4.32	48.09
131	4.39	0.02	4.85	272.6%	20.19	15.33	131.7	20.7	100.7%	75.5%	76.0%	23.4	4.39	49.50	4.29	48.46
132	4.36	0.04	5.72	215.2%	20.05	14.32	132.8	20.7	100.2%	77.4%	77.5%	19.8	4.36	49.82	4.26	48.78
133	4.34	0.03	5.08	255.3%	20.15	15.06	132.3	20.7	100.5%	76.0%	76.4%	22.3	4.34	50.08	4.24	49.04
134	4.30	0.05	6.55	175.0%	19.92	13.35	134.0	20.7	100.0%	78.7%	78.7%	17.3	4.30	50.55	4.20	49.51
135	4.27	0.03	4.76	279.2%	20.20	15.43	133.3	20.8	100.5%	75.1%	75.5%	23.8	4.27	50.81	4.18	49.78
136	4.25	0.03	6.01	200.4%	20.01	13.98	133.1	20.8	100.3%	77.9%	78.2%	18.9	4.25	51.12	4.15	50.09
137	4.22	0.02	4.98	263.2%	20.17	15.18	132.9	20.8	100.6%	75.7%	76.2%	22.9	4.22	51.38	4.13	50.35
138	4.20	0.03	5.21	246.6%	20.13	14.91	133.8	20.9	100.4%	76.2%	76.5%	21.8	4.20	51.70	4.11	50.67
139	4.18	0.03	4.90	268.0%	20.18	15.26	132.1	20.9	100.5%	75.6%	76.0%	23.1	4.18	51.91	4.09	50.88
140	4.14	0.03	4.76	279.0%	20.20	15.43	132.4	20.8	100.5%	75.2%	75.6%	23.8	4.14	52.32	4.05	51.30
141	4.12	0.02	5.08	255.6%	20.15	15.06	131.8	20.9	100.6%	76.1%	76.6%	22.4	4.12	52.58	4.03	51.56
142	4.09	0.03	5.89	206.6%	20.03	14.12	132.2	20.9	100.3%	77.8%	78.1%	19.3	4.09	52.90	4.01	51.88
143	4.07	0.03	4.85	271.6%	20.19	15.32	132.4	20.9	100.5%	75.5%	75.8%	23.4	4.07	53.21	3.98	52.20
144	4.04	0.05	6.96	158.8%	19.86	12.87	132.4	20.9	100.0%	79.4%	79.4%	16.3	4.04	53.52	3.95	52.51
145	4.01	0.03	4.61	291.2%	20.22	15.60	132.1	20.8	100.5%	74.8%	75.2%	24.6	4.01	53.84	3.93	52.83
146	3.98	0.04	5.98	201.2%	20.01	14.01	132.5	20.9	100.2%	77.9%	78.1%	19.0	3.98	54.15	3.90	53.14
147	3.96	0.03	5.51	227.4%	20.09	14.56	132.7	21.0	100.4%	77.0%	77.3%	20.6	3.96	54.46	3.87	53.46
148	3.93	0.03	5.29	240.8%	20.12	14.81	132.1	21.1	100.4%	76.6%	77.0%	21.4	3.93	54.78	3.85	53.78
149	3.90	0.03	4.60	291.8%	20.23	15.61	132.5	21.1	100.5%	74.8%	75.2%	24.6	3.90	55.14	3.82	54.15
150	3.87	0.05	6.74	167.0%	19.89	13.12	133.4	21.1	100.0%	79.1%	79.1%	16.8	3.87	55.46	3.79	54.46
151	3.84	0.03	5.99	201.4%	20.01	14.01	132.9	21.1	100.3%	77.9%	78.2%	19.0	3.84	55.77	3.76	54.78
152	3.82	0.03	5.06	256.7%	20.16	15.08	132.0	21.1	100.5%	76.1%	76.4%	22.4	3.82	56.03	3.74	55.04
153	3.79	0.03	5.11	252.7%	20.15	15.02	131.6	21.1	100.4%	76.3%	76.6%	22.2	3.79	56.34	3.72	55.36
154	3.77	0.02	5.76	213.8%	20.05	14.28	132.0	21.1	100.5%	77.6%	78.0%	19.8	3.77	56.61	3.69	55.62
155	3.73	0.05	6.25	188.1%	19.97	13.70	133.1	21.1	100.0%	78.3%	78.4%	18.1	3.73	57.02	3.66	56.04
156	3.71	0.04	6.05	198.0%	20.00	13.93	133.2	21.1	100.2%	78.0%	78.1%	18.8	3.71	57.28	3.64	56.31
157	3.67	0.04	5.46	230.1%	20.09	14.62	134.3	21.1	100.2%	76.7%	76.9%	20.8	3.67	57.75	3.60	56.78
158	3.65	0.03	5.58	223.3%	20.07	14.48	134.7	21.1	100.4%	76.9%	77.2%	20.3	3.65	58.02	3.58	57.05
159	3.62	0.03	4.45	304.6%	20.25	15.78	135.3	21.1	100.6%	73.9%	74.4%	25.4	3.62	58.38	3.54	57.42
160	3.59	0.03	5.61	221.5%	20.07	14.44	135.1	21.1	100.4%	77.0%	77.2%	20.2	3.59	58.69	3.52	57.74
161	3.56	0.03	5.57	223.7%	20.08	14.49	136.2	21.2	100.4%	76.8%	77.1%	20.4	3.56	59.06	3.49	58.11
162	3.53	0.03	5.19	247.4%	20.13	14.93	134.7	21.1	100.4%	76.1%	76.4%	21.9	3.53	59.32	3.47	58.37
163	3.51	0.03	6.10	195.8%	19.99	13.88	134.2	21.2	100.3%	78.0%	78.3%	18.6	3.51	59.63	3.44	58.69
164	3.48	0.03	4.92	266.4%	20.18	15.24	133.6	21.2	100.5%	75.5%	75.9%	23.0	3.48	59.90	3.42	58.95
165	3.46	0.03	4.44	305.8%	20.25	15.79	132.8	21.1	100.6%	74.2%	74.6%	25.5	3.46	60.21	3.39	59.27
166	3.43	0.03	4.97	262.7%	20.17	15.18	133.2	20.8	100.5%	75.7%	76.0%	22.8	3.43	60.57	3.36	59.64
167	3.39	0.04	6.17	192.2%	19.98	13.79	133.8	20.7	100.2%	78.1%	78.2%	18.4	3.39	60.94	3.33	60.01
168	3.37	0.02	5.23	245.6%	20.13	14.89	133.8	20.6	100.6%	76.2%	76.7%	21.8	3.37	61.25	3.30	60.33
169	3.34	0.04	7.21	150.3%	19.82	12.59	134.2	20.5	100.1%	79.6%	79.6%	15.8	3.34	61.51	3.28	60.59
170	3.31	0.03	4.26	322.7%	20.28	16.00	133.4	20.5	100.6%	73.5%	73.9%	26.6	3.31	61.88	3.25	60.96
171	3.29	0.03	6.09	196.5%	20.00	13.89	132.0	20.5	100.3%	78.1%	78.4%	18.7	3.29	62.09	3.23	61.18
172	3.27	0.04	4.08	340.4%	20.30	16.20	130.9	20.3	100.4%	73.1%	73.5%	27.7	3.27	62.40	3.21	61.49
173	3.24	0.03	6.21	190.6%	19.98	13.75	131.4	20.3	100.3%	78.4%	78.6%	18.3	3.24	62.72	3.18	61.81
174	3.21	0.03	4.81	275.2%	20.19	15.37	131.7	20.2	100.5%	75.4%	75.7%	23.6	3.21	63.08	3.15	62.18
175	3.18	0.04	6.26	188.1%	19.97	13.69	132.0	20.3	100.2%	78.4%	78.5%	18.1	3.18	63.39	3.12	62.50
176	3.14	0.03	6.12	195.1%	19.99	13.86	132.7	20.3	100.3%	78.1%	78.3%	18.6	3.14	63.81	3.09	62.92
177	3.12	0.05	7.27	147.9%	19.81	12.52	134.2	20.3	100.0%	79.6%	79.6%	15.6	3.12	64.13	3.06	63.24
178	3.09	0.03	4.93	265.7%	20.18	15.23	133.6	20.2	100.5%	75.4%	75.8%	23.0	3.09	64.44	3.03	63.56
179	3.07	0.03	5.01	260.0%	20.16	15.14	132.6	20.2	100.5%	75.8%	76.1%	22.6	3.07	64.65	3.02	63.77
180	3.04	0.02	4.71	283.8%	20.21	15.49	130.1	20.3	100.7%	75.3%	75.8%	24.1	3.04	65.07	2.98	64.20
181	3.02	0.04	5.03	257.8%	20.16	15.11	126.6	20.3	100.3%	76.6%	76.8%	22.5	3.02	65.27	2.96	64.41
182	3.00	0.02	4.05	345.4%	20.31	16.25	123.0	20.3	100.9%	74.2%	74.9%	28.0	3.00	65.48	2.95	64.62
183	2.99	0.02	4.24	326.3%	20.28	16.04	120.5	20.2	100.8%	75.2%	75.8%	26.8	2.99	65.64	2.93	64.78
184	2.97	0.03	4.38	311.0%	20.26	15.86	117.9	20.1	100.6%	76.0%	76.5%	25.8	2.97	65.80	2.92	64.94
185	2.96	0.03	2.88	523.7%	20.49	17.60	116.0	20.0	101.1%	69.8%	70.6%	39.3	2.96	65.95	2.91	65.10
186	2.94	0.02	3.41	428.9%	20.41	16.99	114.0	20.1	101.1%	73.1%	73.9%	33.3	2.94	66.21	2.88	65.37
187	2.92	0.03	4.61	290.8%	20.22	15.60	112.4	20.0	100.5%	77.4%	77.8%	24.6	2.92	66.42	2.87	65.58
188	2.92	0.02	3.53	410.5%	20.39	16.85	109.9	20.0	101.1%	74.4%	75.1%	32.1	2.92	66.42	2.87	65.58

189	2.89	0.03	2.95	509.0%	20.48	17.52	109.6	20.1	101.1%	71.6%	72.3%	38.3	2.89	66.74	2.84	65.90
190	2.87	0.03	4.87	270.5%	20.19	15.30	110.0	20.0	100.5%	78.3%	78.7%	23.3	2.87	67.00	2.82	66.16
191	2.84	0.02	3.79	376.2%	20.35	16.55	109.8	20.0	101.0%	75.3%	76.1%	30.0	2.84	67.26	2.79	66.43
192	2.84	0.03	4.70	283.6%	20.21	15.50	108.7	20.0	100.5%	78.1%	78.5%	24.1	2.84	67.36	2.79	66.53
193	2.81	0.02	3.45	422.2%	20.40	16.94	107.8	19.9	101.1%	74.4%	75.2%	32.9	2.81	67.62	2.76	66.80
194	2.79	0.02	3.31	445.7%	20.43	17.11	106.9	19.9	101.2%	73.9%	74.8%	34.3	2.79	67.83	2.75	67.01
195	2.77	0.02	4.88	270.0%	20.18	15.29	107.4	19.9	100.7%	78.7%	79.2%	23.3	2.77	68.15	2.72	67.33
196	2.76	0.02	4.45	305.6%	20.25	15.79	106.6	19.9	100.8%	77.8%	78.4%	25.5	2.76	68.20	2.72	67.38
197	2.75	0.02	3.29	448.5%	20.43	17.13	104.9	19.8	101.2%	74.2%	75.0%	34.5	2.75	68.30	2.71	67.49
198	2.73	0.02	3.33	441.4%	20.42	17.08	104.3	19.8	101.2%	74.5%	75.3%	34.1	2.73	68.56	2.68	67.76
199	2.72	0.05	4.99	260.3%	20.16	15.15	103.8	19.8	100.1%	79.3%	79.4%	22.6	2.72	68.67	2.68	67.86
200	2.70	0.02	3.33	441.7%	20.42	17.08	104.2	19.8	101.2%	74.5%	75.3%	34.1	2.70	68.98	2.65	68.18
201	2.68	0.02	4.15	335.0%	20.30	16.14	103.7	19.8	100.8%	77.4%	78.0%	27.4	2.68	69.19	2.63	68.40
202	2.67	0.01	3.99	353.9%	20.32	16.33	103.6	19.8	101.1%	76.9%	77.8%	28.6	2.67	69.30	2.62	68.50
203	2.64	0.02	3.84	369.5%	20.34	16.49	102.7	19.7	100.9%	76.6%	77.4%	29.5	2.64	69.61	2.60	68.82
204	2.63	0.02	3.69	389.0%	20.37	16.67	102.3	19.7	101.0%	76.2%	76.9%	30.8	2.63	69.71	2.59	68.93
205	2.61	0.01	3.27	453.0%	20.43	17.16	101.6	19.7	101.4%	74.7%	75.8%	34.8	2.61	69.97	2.56	69.19
206	2.59	0.01	3.99	353.1%	20.32	16.32	101.1	19.7	101.1%	77.3%	78.2%	28.5	2.59	70.23	2.54	69.46
207	2.56	0.02	4.32	318.2%	20.27	15.94	101.9	19.7	100.8%	78.1%	78.7%	26.3	2.56	70.50	2.52	69.73
208	2.55	0.03	4.27	321.6%	20.28	15.99	102.3	19.6	100.6%	77.9%	78.4%	26.5	2.55	70.60	2.51	69.83
209	2.54	0.02	3.97	354.3%	20.32	16.34	102.4	19.6	100.9%	77.1%	77.8%	28.6	2.54	70.81	2.49	70.04
210	2.52	0.01	3.48	420.3%	20.40	16.92	101.7	19.6	101.3%	75.5%	76.5%	32.8	2.52	70.97	2.48	70.20
211	2.51	0.01	3.66	394.8%	20.37	16.71	101.0	19.6	101.3%	76.3%	77.2%	31.1	2.51	71.12	2.47	70.36
212	2.49	0.03	3.70	386.7%	20.37	16.65	100.9	19.6	100.8%	76.4%	77.0%	30.6	2.49	71.33	2.45	70.58
213	2.47	0.03	4.79	276.6%	20.20	15.40	101.8	19.6	100.5%	79.1%	79.5%	23.7	2.47	71.54	2.43	70.79
214	2.46	0.03	2.83	534.6%	20.50	17.66	100.6	19.6	101.1%	72.7%	73.5%	40.0	2.46	71.70	2.42	70.95
215	2.45	0.05	2.33	661.3%	20.57	18.21	99.1	19.6	100.7%	69.6%	70.1%	47.9	2.45	71.85	2.40	71.11
216	2.42	0.02	4.27	322.7%	20.28	16.00	99.8	19.5	100.8%	78.2%	78.9%	26.6	2.42	72.11	2.38	71.38
217	2.40	0.02	4.35	315.0%	20.27	15.90	100.4	19.6	100.8%	78.4%	79.0%	26.1	2.40	72.38	2.36	71.64
218	2.39	0.04	5.00	259.7%	20.16	15.14	100.3	19.5	100.3%	79.7%	80.0%	22.6	2.39	72.53	2.35	71.80
219	2.37	0.02	3.51	414.5%	20.40	16.88	100.1	19.5	101.1%	75.9%	76.7%	32.4	2.37	72.69	2.33	71.96
220	2.36	0.02	4.04	346.6%	20.31	16.26	99.9	19.5	100.9%	77.6%	78.3%	28.1	2.36	72.85	2.32	72.12
221	2.34	0.03	2.81	539.3%	20.50	17.68	99.9	19.5	101.1%	72.7%	73.5%	40.2	2.34	73.05	2.30	72.34
222	2.33	0.02	3.78	377.8%	20.35	16.57	98.6	19.5	101.0%	77.0%	77.8%	30.1	2.33	73.16	2.29	72.44
223	2.32	0.01	3.16	472.9%	20.45	17.29	97.4	19.4	101.5%	74.9%	76.1%	36.1	2.32	73.32	2.28	72.60
224	2.29	0.01	3.10	483.6%	20.46	17.36	97.7	19.4	101.5%	74.6%	75.8%	36.8	2.29	73.63	2.25	72.92
225	2.27	0.02	4.54	298.3%	20.24	15.69	97.4	19.4	100.7%	79.2%	79.8%	25.1	2.27	73.84	2.24	73.14
226	2.27	0.01	3.29	449.3%	20.43	17.13	96.7	19.5	101.4%	75.7%	76.8%	34.6	2.27	73.89	2.23	73.19
227	2.25	0.04	4.88	269.1%	20.18	15.29	96.8	19.5	100.3%	79.9%	80.2%	23.2	2.25	74.05	2.22	73.35
228	2.23	0.01	3.63	398.3%	20.38	16.74	97.2	19.5	101.3%	76.8%	77.8%	31.4	2.23	74.36	2.19	73.67
229	2.22	0.02	4.17	332.8%	20.29	16.11	97.1	19.6	100.8%	78.4%	79.1%	27.2	2.22	74.41	2.19	73.72
230	2.20	0.02	3.33	441.6%	20.42	17.08	97.4	19.4	101.2%	75.6%	76.5%	34.1	2.20	74.73	2.16	74.04
231	2.18	0.03	4.86	271.2%	20.19	15.31	97.7	19.4	100.5%	79.8%	80.2%	23.3	2.18	74.88	2.15	74.20
232	2.17	0.02	4.05	346.0%	20.31	16.25	97.1	19.5	100.9%	78.1%	78.8%	28.1	2.17	75.04	2.13	74.36
233	2.15	0.03	2.48	623.1%	20.55	18.06	96.2	19.5	101.3%	71.4%	72.4%	45.6	2.15	75.25	2.12	74.58
234	2.13	0.01	3.39	434.1%	20.42	17.02	96.4	19.4	101.4%	76.1%	77.1%	33.6	2.13	75.46	2.10	74.79
235	2.11	0.02	4.42	309.1%	20.26	15.83	96.9	19.4	100.8%	79.0%	79.6%	25.7	2.11	75.67	2.08	75.00
236	2.11	0.02	4.04	346.9%	20.31	16.26	96.3	19.4	100.9%	78.2%	78.9%	28.1	2.11	75.77	2.07	75.11
237	2.08	0.03	4.36	313.2%	20.26	15.89	97.7	19.5	100.6%	78.8%	79.2%	26.0	2.08	76.08	2.05	75.43
238	2.06	0.05	5.29	239.8%	20.12	14.80	98.6	19.4	100.1%	80.4%	80.5%	21.4	2.06	76.34	2.02	75.70
239	2.04	0.04	3.64	392.9%	20.37	16.71	99.0	19.4	100.5%	76.5%	76.9%	31.0	2.04	76.50	2.01	75.86
240	2.02	0.02	3.59	402.7%	20.38	16.78	99.3	19.4	101.0%	76.3%	77.1%	31.6	2.02	76.71	1.99	76.07
241	2.00	0.04	4.94	264.3%	20.17	15.21	100.4	19.4	100.3%	79.6%	79.8%	22.9	2.00	76.97	1.97	76.34
242	1.99	0.02	3.55	408.3%	20.39	16.83	99.8	19.4	101.1%	76.1%	76.9%	32.0	1.99	77.13	1.96	76.50
243	1.97	0.03	4.48	302.6%	20.25	15.75	100.0	19.6	100.6%	78.7%	79.1%	25.3	1.97	77.34	1.94	76.71
244	1.94	0.02	3.90	362.9%	20.34	16.43	100.9	19.6	100.9%	77.1%	77.8%	29.1	1.94	77.70	1.91	77.09
245	1.94	0.03	3.27	449.5%	20.43	17.14	99.7	19.6	100.9%	75.0%	75.7%	34.6	1.94	77.65	1.91	77.03
246	1.93	0.03	3.32	441.3%	20.42	17.09	100.0	19.5	100.9%	75.2%	75.8%	34.0	1.93	77.81	1.90	77.19
247	1.90	0.02	3.27	450.8%	20.43	17.15	99.9	19.5	101.2%	75.0%	75.9%	34.7	1.90	78.17	1.87	77.57
248	1.88	0.03	4.70	283.4%	20.21	15.49	100.8	19.5	100.5%	79.1%	79.5%	24.1	1.88	78.38	1.85	77.78
249	1.86	0.02	4.37	313.4%	20.26	15.88	101.0	19.4	100.8%	78.3%	78.9%	26.0	1.86	78.54	1.84	77.94
250	1.86	0.02	3.78	377.4%	20.35	16.56	100.4	19.6	101.0%	76.8%	77.5%	30.0	1.86	78.59	1.83	77.99
251	1.86	0.02	2.66	577.7%	20.53	17.86	97.7	19.5	101.5%	72.3%	73.4%	42.7	1.86	78.64	1.83	78.05
252	1.83	0.03	2.55	602.7%	20.54	17.97	97.1	19.6	101.3%	71.7%	72.7%	44.3	1.83	78.90	1.81	78.31
253	1.81	0.03	2.91	518.2%	20.49	17.57	96.9	19.6	101.1%	73.9%	74.6%	38.9	1.81	79.16	1.78	78.58
254	1.80	0.02	4.52	299.3%	20.24	15.71	96.8	19.5	100.7%	79.3%	79.8%	25.1	1.80	79.32	1.77	78.74
255	1.77	0.04	2.77	546.8%	20.51	17.72	95.9	19.5	100.8%	73.3%	73.9%	40.7	1.77	79.58	1.75	79.01
256	1.76	0.01	2.96	510.7%	20.48	17.52	95.8	19.5	101.6%	74.4%	75.6%	38.5	1.76	79.74	1.73	79.17
257	1.74	0.02	3.52	412.2%	20.39	16.86	96.6	19.5	101.1%	76.5%	77.4%	32.2	1.74	80.00	1.71	79.44
258	1.72	0.05	5.09	253.1%	20.15	15.03	97.1	19.4	100.1%	80.3%	80.4%	22.2	1.72	80.16	1.70	79.60

259	1.71	0.03	2.57	597.0%	20.54	17.95	96.4	19.4	101.3%	72.0%	72.9%	43.9	1.71	80.37	1.68	79.81
260	1.68	0.02	4.43	307.5%	20.25	15.81	97.6	19.5	100.8%	78.9%	79.5%	25.6	1.68	80.63	1.66	80.08
261	1.68	0.03	4.69	284.7%	20.21	15.51	98.1	19.5	100.5%	79.4%	79.8%	24.2	1.68	80.68	1.65	80.13
262	1.65	0.03	3.28	449.0%	20.43	17.14	98.6	19.6	100.9%	75.2%	75.9%	34.5	1.65	80.99	1.63	80.45
263	1.63	0.02	3.99	352.3%	20.32	16.32	98.8	19.7	100.9%	77.7%	78.4%	28.5	1.63	81.20	1.61	80.67
264	1.62	0.02	3.58	404.7%	20.39	16.80	98.6	19.6	101.0%	76.4%	77.2%	31.8	1.62	81.31	1.60	80.77
265	1.60	0.02	3.23	457.9%	20.44	17.20	99.7	19.6	101.2%	74.9%	75.7%	35.1	1.60	81.57	1.58	81.04
266	1.58	0.03	5.42	233.0%	20.10	14.67	99.8	19.6	100.4%	80.5%	80.8%	21.0	1.58	81.78	1.56	81.26
267	1.57	0.03	2.80	540.4%	20.50	17.69	98.4	19.6	101.1%	73.0%	73.8%	40.3	1.57	81.93	1.55	81.42
268	1.56	0.02	2.54	609.5%	20.55	18.00	97.2	19.6	101.6%	71.6%	72.8%	44.7	1.56	82.09	1.53	81.58
269	1.55	0.01	3.41	430.2%	20.41	17.00	96.1	19.6	101.4%	76.2%	77.3%	33.4	1.55	82.19	1.52	81.68
270	1.52	0.03	4.31	318.1%	20.27	15.95	97.3	19.6	100.6%	78.7%	79.2%	26.3	1.52	82.51	1.50	82.01
271	1.51	0.03	3.27	449.5%	20.43	17.14	96.7	19.6	100.9%	75.6%	76.3%	34.6	1.51	82.66	1.48	82.17
272	1.48	0.02	3.59	402.9%	20.38	16.79	97.9	19.8	101.0%	76.6%	77.4%	31.6	1.48	82.92	1.46	82.43
273	1.47	0.03	4.34	315.5%	20.27	15.91	98.3	19.7	100.6%	78.6%	79.1%	26.1	1.47	83.08	1.45	82.59
274	1.45	0.02	2.95	510.9%	20.48	17.52	98.1	19.6	101.3%	73.9%	74.9%	38.5	1.45	83.34	1.43	82.86
275	1.43	0.02	4.24	325.7%	20.28	16.03	99.6	19.5	100.8%	78.2%	78.8%	26.8	1.43	83.55	1.41	83.08
276	1.42	0.04	4.70	283.1%	20.21	15.49	99.2	19.6	100.3%	79.3%	79.6%	24.1	1.42	83.71	1.40	83.24
277	1.39	0.03	2.95	508.0%	20.48	17.51	98.5	19.6	101.1%	73.8%	74.6%	38.3	1.39	83.97	1.37	83.50
278	1.39	0.02	3.50	415.9%	20.40	16.89	98.2	19.7	101.1%	76.2%	77.0%	32.5	1.39	83.97	1.37	83.50
279	1.37	0.02	3.59	402.7%	20.38	16.78	96.6	19.6	101.0%	76.8%	77.6%	31.6	1.37	84.18	1.36	83.72
280	1.35	0.03	2.45	631.6%	20.56	18.09	97.1	19.7	101.3%	71.1%	72.0%	46.1	1.35	84.44	1.33	83.99
281	1.35	0.02	4.58	294.4%	20.23	15.64	97.4	19.6	100.7%	79.3%	79.9%	24.8	1.35	84.49	1.33	84.04
282	1.33	0.02	3.76	380.4%	20.36	16.59	97.3	19.6	101.0%	77.2%	78.0%	30.2	1.33	84.70	1.31	84.25
283	1.30	0.02	4.09	341.8%	20.31	16.21	98.4	19.6	100.9%	78.0%	78.7%	27.8	1.30	85.01	1.28	84.58
284	1.29	0.03	4.04	345.3%	20.31	16.25	98.1	19.6	100.7%	77.9%	78.4%	28.0	1.29	85.12	1.28	84.68
285	1.28	0.02	3.59	402.4%	20.38	16.78	98.0	19.6	101.0%	76.5%	77.3%	31.6	1.28	85.27	1.26	84.84
286	1.26	0.01	2.89	524.8%	20.49	17.59	97.8	19.6	101.7%	73.6%	74.9%	39.4	1.26	85.48	1.24	85.06
287	1.24	0.02	3.23	458.4%	20.44	17.20	98.2	19.6	101.2%	75.1%	76.0%	35.2	1.24	85.69	1.23	85.27
288	1.23	0.02	4.28	322.3%	20.28	15.99	98.2	19.6	100.8%	78.5%	79.1%	26.6	1.23	85.90	1.21	85.49
289	1.21	0.02	3.93	359.4%	20.33	16.39	97.7	19.5	100.9%	77.6%	78.4%	28.9	1.21	86.11	1.19	85.70
290	1.19	0.02	3.59	402.6%	20.38	16.78	97.5	19.6	101.0%	76.6%	77.4%	31.6	1.19	86.27	1.18	85.86
291	1.17	0.03	3.88	364.2%	20.34	16.44	97.7	19.6	100.7%	77.5%	78.0%	29.2	1.17	86.53	1.15	86.13
292	1.15	0.03	2.68	569.5%	20.52	17.83	96.7	19.6	101.2%	72.7%	73.5%	42.2	1.15	86.74	1.14	86.35
293	1.13	0.02	4.31	319.0%	20.27	15.95	97.5	19.6	100.8%	78.7%	79.3%	26.4	1.13	86.95	1.12	86.56
294	1.12	0.02	3.16	470.9%	20.45	17.28	96.9	19.6	101.2%	75.1%	76.0%	35.9	1.12	87.10	1.11	86.72
295	1.12	0.02	3.06	490.0%	20.47	17.40	96.2	19.6	101.3%	74.7%	75.7%	37.2	1.12	87.15	1.10	86.77
296	1.09	0.02	3.93	359.4%	20.33	16.39	95.6	19.6	100.9%	78.0%	78.7%	28.9	1.09	87.42	1.08	87.04
297	1.07	0.04	5.06	255.5%	20.15	15.07	98.3	19.6	100.3%	80.1%	80.3%	22.4	1.07	87.68	1.06	87.31
298	1.06	0.02	3.39	432.4%	20.41	17.02	97.8	19.6	101.1%	75.9%	76.7%	33.5	1.06	87.83	1.04	87.47
299	1.04	0.02	4.15	334.8%	20.30	16.13	97.0	19.6	100.8%	78.4%	79.0%	27.4	1.04	87.99	1.03	87.63
300	1.02	0.07	2.22	692.6%	20.59	18.33	98.2	19.6	100.0%	68.9%	68.9%	49.8	1.02	88.30	1.00	87.96
301	1.01	0.02	4.08	342.4%	20.31	16.22	97.9	19.6	100.9%	78.0%	78.7%	27.8	1.01	88.41	0.99	88.06
302	0.98	0.01	3.66	394.2%	20.37	16.71	97.7	19.6	101.3%	76.8%	77.8%	31.1	0.98	88.77	0.96	88.44
303	0.97	0.02	3.73	383.7%	20.36	16.62	98.7	19.8	101.0%	76.9%	77.7%	30.4	0.97	88.88	0.95	88.55
304	0.96	0.03	4.16	333.3%	20.29	16.12	98.3	19.7	100.6%	78.2%	78.7%	27.2	0.96	88.98	0.94	88.65
305	0.93	0.02	3.83	371.2%	20.35	16.51	98.4	19.7	101.0%	77.3%	78.0%	29.6	0.93	89.24	0.92	88.92
306	0.91	0.02	3.29	448.1%	20.43	17.13	97.9	19.7	101.2%	75.5%	76.3%	34.5	0.91	89.50	0.90	89.19
307	0.90	0.02	2.89	522.8%	20.49	17.59	98.0	19.7	101.4%	73.6%	74.6%	39.2	0.90	89.66	0.89	89.35
308	0.88	0.04	5.30	240.0%	20.12	14.80	99.6	19.7	100.3%	80.4%	80.6%	21.4	0.88	89.92	0.86	89.62
309	0.86	0.02	3.88	365.8%	20.34	16.45	99.7	19.6	100.9%	77.2%	77.9%	29.3	0.86	90.13	0.85	89.83
310	0.84	0.02	3.11	480.2%	20.46	17.34	99.1	19.7	101.3%	74.4%	75.4%	36.5	0.84	90.29	0.83	89.99
311	0.83	0.03	3.67	390.2%	20.37	16.68	98.6	19.7	100.8%	76.7%	77.3%	30.8	0.83	90.39	0.82	90.10
312	0.81	0.02	3.13	475.6%	20.45	17.31	99.1	19.7	101.2%	74.6%	75.5%	36.2	0.81	90.65	0.80	90.37
313	0.80	0.02	4.54	298.2%	20.24	15.69	99.8	19.7	100.7%	78.9%	79.5%	25.1	0.80	90.81	0.79	90.53
314	0.78	0.02	3.38	433.5%	20.42	17.02	98.8	19.7	101.1%	75.7%	76.5%	33.6	0.78	90.97	0.77	90.69
315	0.76	0.02	3.66	393.3%	20.37	16.70	99.4	19.6	101.0%	76.5%	77.3%	31.0	0.76	91.28	0.75	91.02
316	0.74	0.03	3.87	364.8%	20.34	16.45	100.1	19.7	100.7%	77.1%	77.7%	29.2	0.74	91.44	0.73	91.18
317	0.72	0.02	3.31	444.8%	20.43	17.11	101.2	19.8	101.2%	75.0%	75.8%	34.3	0.72	91.70	0.71	91.45
318	0.70	0.02	3.23	458.1%	20.44	17.20	100.6	19.8	101.2%	74.7%	75.6%	35.1	0.70	91.91	0.69	91.66
319	0.70	0.02	4.12	338.2%	20.30	16.17	99.6	19.8	100.9%	77.9%	78.6%	27.6	0.70	91.96	0.69	91.71
320	0.69	0.02	2.52	613.4%	20.55	18.01	98.6	19.7	101.6%	71.3%	72.4%	45.0	0.69	92.11	0.68	91.88
321	0.66	0.02	4.12	338.7%	20.30	16.18	98.8	19.7	100.9%	78.0%	78.7%	27.6	0.66	92.38	0.65	92.14
322	0.64	0.04	4.97	262.4%	20.17	15.18	99.6	19.8	100.3%	79.8%	80.0%	22.8	0.64	92.58	0.64	92.36
323	0.64	0.03	2.85	530.0%	20.50	17.63	97.6	19.8	101.1%	73.5%	74.3%	39.7	0.64	92.64	0.63	92.41
324	0.62	0.03	2.75	552.4%	20.51	17.75	96.7	19.7	101.2%	73.1%	73.9%	41.1	0.62	92.85	0.61	92.63
325	0.59	0.02	3.82	372.7%	20.35	16.52	96.7	19.7	101.0%	77.5%	78.2%	29.7	0.59	93.16	0.59	92.95
326	0.58	0.02	2.89	524.1%	20.49	17.59	95.9	19.7	101.4%	74.0%	75.0%	39.3	0.58	93.32	0.57	93.11
327	0.56	0.01	3.34	440.9%	20.42	17.07	95.9	19.7	101.4%	76.0%	77.1%	34.1	0.56	93.52	0.56	93.33
328	0.54	0.02	3.24	456.2%	20.44	17.19	96.4	19.7	101.2%	75.5%	76.4%	35.0	0.54	93.73	0.54	93.54

329	0.53	0.03	4.63	289.0%	20.22	15.57	97.2	19.7	100.5%	79.4%	79.9%	24.5	0.53	93.94	0.52	93.76
330	0.50	0.03	2.73	557.4%	20.51	17.77	97.9	19.7	101.2%	72.7%	73.6%	41.4	0.50	94.20	0.50	94.03
331	0.49	0.03	4.42	307.9%	20.25	15.82	98.9	19.7	100.6%	78.7%	79.2%	25.7	0.49	94.36	0.48	94.19
332	0.48	0.02	3.39	432.5%	20.41	17.02	98.9	19.7	101.1%	75.7%	76.5%	33.5	0.48	94.46	0.47	94.29
333	0.46	0.02	3.06	488.9%	20.46	17.39	99.3	19.7	101.3%	74.2%	75.1%	37.1	0.46	94.67	0.46	94.51
334	0.44	0.02	3.87	366.3%	20.34	16.46	100.4	19.7	100.9%	77.1%	77.8%	29.3	0.44	94.99	0.43	94.83
335	0.43	0.03	4.06	343.9%	20.31	16.24	99.6	19.7	100.7%	77.7%	78.3%	27.9	0.43	95.09	0.42	94.94
336	0.41	0.02	3.02	496.4%	20.47	17.44	98.9	19.7	101.3%	74.1%	75.0%	37.6	0.41	95.30	0.40	95.15
337	0.39	0.02	2.82	539.3%	20.50	17.67	99.3	19.7	101.4%	72.9%	74.0%	40.3	0.39	95.51	0.39	95.37
338	0.38	0.05	5.61	220.3%	20.07	14.43	100.8	19.8	100.1%	80.7%	80.8%	20.1	0.38	95.67	0.37	95.53
339	0.35	0.06	3.05	483.2%	20.46	17.38	100.2	19.7	100.2%	73.9%	74.1%	36.6	0.35	95.98	0.35	95.85
340	0.34	0.03	4.41	308.3%	20.25	15.83	100.0	19.9	100.6%	78.6%	79.1%	25.7	0.34	96.14	0.33	96.02
341	0.33	0.01	3.48	419.6%	20.40	16.91	99.2	19.7	101.3%	76.0%	77.0%	32.7	0.33	96.19	0.33	96.07
342	0.31	0.03	3.94	356.5%	20.33	16.37	98.9	19.7	100.7%	77.5%	78.1%	28.7	0.31	96.40	0.31	96.28
343	0.29	0.02	3.70	387.7%	20.37	16.66	99.6	19.8	101.0%	76.7%	77.4%	30.7	0.29	96.71	0.28	96.61
344	0.27	0.02	3.82	372.6%	20.35	16.52	99.0	19.8	101.0%	77.2%	77.9%	29.7	0.27	96.87	0.27	96.77
345	0.25	0.02	3.03	494.7%	20.47	17.43	99.6	19.7	101.3%	74.0%	75.0%	37.4	0.25	97.08	0.25	96.98
346	0.24	0.02	3.71	386.9%	20.37	16.65	99.8	19.7	101.0%	76.7%	77.4%	30.6	0.24	97.28	0.23	97.20
347	0.22	0.03	3.97	353.6%	20.32	16.34	98.9	19.7	100.7%	77.6%	78.1%	28.5	0.22	97.44	0.22	97.36
348	0.21	0.02	3.10	482.2%	20.46	17.35	98.0	19.7	101.3%	74.6%	75.6%	36.7	0.21	97.60	0.21	97.52
349	0.18	0.02	3.57	405.8%	20.39	16.81	99.2	19.7	101.0%	76.3%	77.1%	31.8	0.18	97.91	0.18	97.85
350	0.16	0.03	5.17	249.2%	20.14	14.96	100.3	19.9	100.4%	80.1%	80.4%	22.0	0.16	98.17	0.16	98.11
351	0.15	0.02	2.99	502.2%	20.48	17.47	99.8	19.8	101.3%	73.8%	74.8%	37.9	0.15	98.33	0.14	98.28
352	0.14	0.02	3.78	377.3%	20.35	16.56	99.3	19.8	101.0%	77.0%	77.7%	30.0	0.14	98.43	0.13	98.38
353	0.11	0.02	4.02	348.9%	20.32	16.28	98.6	19.8	100.9%	77.8%	78.5%	28.2	0.11	98.69	0.11	98.65
354	0.10	0.03	3.88	363.5%	20.34	16.44	99.6	19.8	100.7%	77.3%	77.8%	29.1	0.10	98.85	0.10	98.81
355	0.08	0.04	4.25	322.9%	20.28	16.01	100.4	19.9	100.4%	78.1%	78.5%	26.6	0.08	99.11	0.08	99.08
356	0.06	0.02	3.77	379.2%	20.36	16.58	99.9	20.2	101.0%	76.9%	77.7%	30.2	0.06	99.32	0.06	99.30
357	0.05	0.05	2.29	676.0%	20.58	18.27	99.8	20.2	100.7%	69.2%	69.7%	48.9	0.05	99.48	0.04	99.46
358	0.03	0.02	3.67	391.4%	20.37	16.69	99.9	20.2	101.0%	76.6%	77.4%	30.9	0.03	99.63	0.03	99.62
359	0.01	0.05	5.15	248.9%	20.14	14.96	101.4	20.3	100.1%	79.9%	80.0%	21.9	0.01	99.84	0.01	99.84
360	0.00	0.03	4.34	315.4%	20.27	15.91	101.4	20.3	100.6%	78.3%	78.8%	26.1	0.00	100.00	0.00	100.00

Moisture Content M_{Cwb}: 4.19

Combustion Efficiency:	99.50%		Moisture of Wood (wet basis):	4.19	Dry kg :	8.32
Total Input (kJ):	163,490	155,063 (Btu)	Initial Dry Weight Wt_{do} (kg):	8.32	CA:	47
Total Output (kJ):	124,653	118,227 (Btu)	Moisture Content Dry	4.37	HY:	9
Efficiency:	76.24%				OX:	44.3
Total CO (g):	54.83					

Load Weight (kg):	**8.69**				
Fuel Heating	**HHV**	**LHV**		**HHV**	**LHV**
Value in kj/kg - CV:	**19,639**	**17,787**	Btu/lb	**8449.0**	**7652.2**

163622	3.88	8.59	2.77	19639.20	4.19	79.82	21.17	1.29	5.60	-0.02	0.13	38.97	135.37	0.24	-0.21	687.45	43.61	2.43	394.51
	Fuel Properties				Mw	Mass Balance (moles/100 mole dry flue gas)					kg Wood per 100 mole dfp	Moles per kg of Dry Wood						Moisture	Stack Temp
Total Input	Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value	Moisture Fuel Burnt	[h]	[u]	[w]	[j]	[k]	Nk	CO_2	O_2	CO	HC	N_2	H_2O	Present	K
0	3.88	8.59	2.77	19639.20	4.19	80.37	21.32	2.24	9.63	-0.01	0.22	38.83	49.16	0.22	-0.05	361.30	43.30	2.43	432.43
1024	3.88	8.59	2.77	19639.20	4.19	80.19	21.27	1.90	8.22	-0.02	0.19	38.94	65.53	0.16	-0.09	423.45	43.38	2.43	432.48
811	3.88	8.59	2.77	19639.20	4.19	80.29	21.30	2.10	9.05	-0.01	0.21	38.83	55.26	0.24	-0.06	384.32	43.32	2.43	431.98
854	3.88	8.59	2.77	19639.20	4.19	80.17	21.27	1.89	8.13	-0.02	0.19	38.88	66.65	0.21	-0.09	427.51	43.37	2.43	431.48
640	3.88	8.59	2.77	19639.20	4.19	80.20	21.27	1.94	8.35	-0.02	0.19	38.88	63.72	0.21	-0.08	416.43	43.36	2.43	431.82
726	3.88	8.59	2.77	19639.20	4.19	80.08	21.24	1.73	7.49	-0.02	0.17	38.94	76.40	0.17	-0.11	464.51	43.42	2.43	431.59
768	3.88	8.59	2.77	19639.20	4.19	80.20	21.27	1.92	8.28	-0.02	0.19	38.94	64.69	0.16	-0.09	420.25	43.38	2.43	431.04
598	3.88	8.59	2.77	19639.20	4.19	80.10	21.25	1.76	7.59	-0.02	0.17	38.94	74.65	0.17	-0.11	457.91	43.41	2.43	430.09
640	3.88	8.59	2.77	19639.20	4.19	80.13	21.25	1.81	7.82	-0.02	0.18	38.94	71.24	0.17	-0.10	445.01	43.40	2.43	429.98
811	3.88	8.59	2.77	19639.20	4.19	80.20	21.27	1.93	8.31	-0.02	0.19	38.94	64.21	0.16	-0.09	418.47	43.38	2.43	429.21
854	3.88	8.59	2.77	19639.20	4.19	80.41	21.33	2.29	9.88	-0.01	0.23	38.89	46.78	0.18	-0.06	352.42	43.31	2.43	429.93
896	3.88	8.59	2.77	19639.20	4.19	80.49	21.35	2.44	10.50	-0.01	0.24	38.75	41.31	0.29	-0.03	331.40	43.25	2.43	431.04
854	3.88	8.59	2.77	19639.20	4.19	80.22	21.28	1.97	8.49	-0.02	0.20	38.88	61.91	0.20	-0.08	409.59	43.36	2.43	431.15
726	3.88	8.59	2.77	19639.20	4.19	80.25	21.29	2.02	8.70	-0.02	0.20	38.94	59.32	0.15	-0.08	399.99	43.36	2.43	431.04
598	3.88	8.59	2.77	19639.20	4.19	80.43	21.34	2.34	10.07	-0.01	0.23	38.84	45.10	0.22	-0.05	345.95	43.29	2.43	431.43
640	3.88	8.59	2.77	19639.20	4.19	80.05	21.23	1.68	7.24	-0.02	0.17	38.87	80.50	0.24	-0.11	479.83	43.41	2.43	430.87
854	3.88	8.59	2.77	19639.20	4.19	80.24	21.28	1.99	8.57	-0.02	0.20	38.94	60.96	0.15	-0.09	406.19	43.37	2.43	430.98
683	3.88	8.59	2.77	19639.20	4.19	80.23	21.28	1.99	8.56	-0.02	0.20	38.94	61.02	0.15	-0.09	406.40	43.37	2.43	431.37
598	3.88	8.59	2.77	19639.20	4.19	80.12	21.25	1.80	7.76	-0.02	0.18	38.88	72.12	0.22	-0.10	448.16	43.39	2.43	430.71
854	3.88	8.59	2.77	19639.20	4.19	80.13	21.25	1.80	7.78	-0.02	0.18	38.94	71.74	0.17	-0.10	446.90	43.40	2.43	429.48
854	3.88	8.59	2.77	19639.20	4.19	80.27	21.29	2.06	8.86	-0.01	0.20	38.83	57.47	0.24	-0.06	392.69	43.33	2.43	429.37
598	3.88	8.59	2.77	19639.20	4.19	80.09	21.24	1.74	7.51	-0.02	0.17	38.94	75.96	0.17	-0.11	462.88	43.42	2.43	430.26
598	3.88	8.59	2.77	19639.20	4.19	80.16	21.26	1.87	8.06	-0.02	0.19	38.88	67.61	0.22	-0.09	431.12	43.37	2.43	430.54
598	3.88	8.59	2.77	19639.20	4.19	80.16	21.26	1.85	7.99	-0.02	0.18	38.94	68.61	0.16	-0.10	435.10	43.39	2.43	429.59
854	3.88	8.59	2.77	19639.20	4.19	80.17	21.26	1.88	8.10	-0.02	0.19	38.88	67.09	0.21	-0.09	429.19	43.37	2.43	429.65
854	3.88	8.59	2.77	19639.20	4.19	80.21	21.28	1.94	8.38	-0.02	0.19	38.94	63.39	0.16	-0.09	415.34	43.38	2.43	429.98
598	3.88	8.59	2.77	19639.20	4.19	80.18	21.27	1.89	8.17	-0.02	0.19	38.94	66.15	0.16	-0.09	425.79	43.39	2.43	430.43
768	3.88	8.59	2.77	19639.20	4.19	80.15	21.26	1.84	7.93	-0.02	0.18	38.94	69.54	0.16	-0.10	438.60	43.40	2.43	429.71
854	3.88	8.59	2.77	19639.20	4.19	80.20	21.27	1.94	8.35	-0.02	0.19	38.88	63.73	0.21	-0.08	416.48	43.36	2.43	429.93
811	3.88	8.59	2.77	19639.20	4.19	80.38	21.32	2.25	9.67	-0.01	0.22	38.83	48.75	0.22	-0.05	359.74	43.30	2.43	430.21
683	3.88	8.59	2.77	19639.20	4.19	80.20	21.27	1.94	8.36	-0.02	0.19	38.88	63.60	0.21	-0.08	415.99	43.36	2.43	431.21
726	3.88	8.59	2.77	19639.20	4.19	80.23	21.28	1.98	8.54	-0.02	0.20	38.88	61.31	0.20	-0.08	407.33	43.35	2.43	430.37
683	3.88	8.59	2.77	19639.20	4.19	80.32	21.30	2.14	9.20	-0.01	0.21	38.88	53.57	0.19	-0.07	378.11	43.33	2.43	430.65
811	3.88	8.59	2.77	19639.20	4.19	80.28	21.30	2.07	8.92	-0.02	0.21	38.94	56.76	0.15	-0.08	390.29	43.36	2.43	430.48
939	3.88	8.59	2.77	19639.20	4.19	80.18	21.27	1.90	8.20	-0.02	0.19	38.94	65.79	0.16	-0.09	424.42	43.38	2.43	430.71
640	3.88	8.59	2.77	19639.20	4.19	80.27	21.29	2.06	8.88	-0.01	0.20	38.88	57.24	0.20	-0.07	391.97	43.34	2.43	430.37
768	3.88	8.59	2.77	19639.20	4.19	80.45	21.34	2.38	10.23	-0.01	0.24	38.79	43.68	0.25	-0.04	340.47	43.27	2.43	431.15
854	3.88	8.59	2.77	19639.20	4.19	80.45	21.34	2.37	10.20	-0.01	0.24	38.79	43.94	0.25	-0.04	341.45	43.27	2.43	432.37
726	3.88	8.59	2.77	19639.20	4.19	80.25	21.29	2.02	8.71	-0.01	0.20	38.82	59.23	0.25	-0.07	399.32	43.33	2.43	432.54
726	3.88	8.59	2.77	19639.20	4.19	80.22	21.28	1.95	8.43	-0.02	0.19	38.94	62.73	0.15	-0.09	412.86	43.37	2.43	432.76
811	3.88	8.59	2.77	19639.20	4.19	80.20	21.27	1.93	8.33	-0.02	0.19	38.88	64.02	0.21	-0.08	417.58	43.36	2.43	432.37
768	3.88	8.59	2.77	19639.20	4.19	80.21	21.28	1.96	8.43	-0.02	0.19	38.88	62.66	0.21	-0.08	412.42	43.36	2.43	432.98
640	3.88	8.59	2.77	19639.20	4.19	80.19	21.27	1.90	8.22	-0.02	0.19	38.94	65.52	0.16	-0.09	423.40	43.38	2.43	432.82
75	3.88	8.59	2.77	19639.20	4.19	80.20	21.27	1.92	8.28	-0.02	0.19	38.94	64.63	0.16	-0.09	420.03	43.38	2.43	432.65
192	3.88	8.59	2.77	19639.20	4.19	80.30	21.30	2.11	9.10	-0.01	0.21	38.88	54.74	0.19	-0.07	382.53	43.33	2.43	432.48
750	3.88	8.59	2.77	19639.20	4.19	80.13	21.26	1.83	7.87	-0.02	0.18	38.88	70.34	0.22	-0.09	441.47	43.38	2.43	432.15
667	3.88	8.59	2.77	19639.20	4.19	80.14	21.26	1.83	7.89	-0.02	0.18	38.88	70.08	0.22	-0.09	440.48	43.38	2.43	431.43
584	3.88	8.59	2.77	19639.20	4.19	80.01	21.22	1.62	7.01	-0.02	0.16	38.87	84.73	0.25	-0.11	495.82	43.42	2.43	430.71
709	3.88	8.59	2.77	19639.20	4.19	80.17	21.27	1.89	8.15	-0.02	0.19	38.88	66.37	0.21	-0.09	426.47	43.37	2.43	430.54

918	3.88	8.59	2.77	19639.20	4.19	80.24	21.28	1.99	8.60	-0.02	0.20	38.94	60.58	0.15	-0.09	404.74	43.37	2.43	431.04
710	3.88	8.59	2.77	19639.20	4.19	80.19	21.27	1.91	8.25	-0.02	0.19	38.94	65.03	0.16	-0.09	421.54	43.38	2.43	430.32
585	3.88	8.59	2.77	19639.20	4.19	80.11	21.25	1.78	7.69	-0.02	0.18	38.94	73.18	0.17	-0.11	452.34	43.41	2.43	430.32
669	3.88	8.59	2.77	19639.20	4.19	80.22	21.28	1.96	8.47	-0.02	0.20	38.94	62.15	0.15	-0.09	410.66	43.37	2.43	429.82
753	3.88	8.59	2.77	19639.20	4.19	80.15	21.26	1.84	7.92	-0.02	0.18	38.94	69.64	0.16	-0.10	438.96	43.40	2.43	429.32
795	3.88	8.59	2.77	19639.20	4.19	80.25	21.29	2.02	8.72	-0.02	0.20	38.88	59.06	0.20	-0.08	398.82	43.35	2.43	429.87
838	3.88	8.59	2.77	19639.20	4.19	80.30	21.30	2.09	9.01	-0.02	0.21	38.94	55.75	0.14	-0.08	386.49	43.35	2.43	430.26
755	3.88	8.59	2.77	19639.20	4.19	80.22	21.28	1.96	8.47	-0.02	0.20	38.94	62.22	0.15	-0.09	410.93	43.37	2.43	430.21
671	3.88	8.59	2.77	19639.20	4.19	80.37	21.32	2.24	9.63	-0.01	0.22	38.78	49.14	0.27	-0.05	361.08	43.29	2.43	430.04
671	3.88	8.59	2.77	19639.20	4.19	80.34	21.31	2.18	9.40	-0.01	0.22	38.83	51.48	0.23	-0.06	370.04	43.31	2.43	430.37
672	3.88	8.59	2.77	19639.20	4.19	80.13	21.25	1.81	7.83	-0.02	0.18	38.88	71.03	0.22	-0.09	444.07	43.38	2.43	430.15
546	3.88	8.59	2.77	19639.20	4.19	80.21	21.28	1.94	8.39	-0.02	0.19	38.94	63.26	0.16	-0.09	414.86	43.38	2.43	430.26
462	3.88	8.59	2.77	19639.20	4.19	80.39	21.32	2.28	9.82	-0.01	0.23	38.73	47.35	0.31	-0.04	354.20	43.27	2.43	426.43
420	3.88	8.59	2.77	19639.20	4.19	79.90	21.19	1.43	6.20	-0.02	0.14	38.95	101.94	0.21	-0.15	561.03	43.50	2.43	422.93
505	3.88	8.59	2.77	19639.20	4.19	79.95	21.21	1.50	6.50	-0.02	0.15	38.95	95.07	0.20	-0.14	535.07	43.48	2.43	419.43
589	3.88	8.59	2.77	19639.20	4.19	80.05	21.23	1.68	7.26	-0.02	0.17	38.87	80.15	0.24	-0.11	478.52	43.41	2.43	418.98
547	3.88	8.59	2.77	19639.20	4.19	80.13	21.25	1.82	7.86	-0.02	0.18	38.81	70.58	0.28	-0.08	442.20	43.36	2.43	417.87
505	3.88	8.59	2.77	19639.20	4.19	79.98	21.22	1.57	6.79	-0.02	0.16	38.87	88.97	0.26	-0.12	511.84	43.44	2.43	416.59
379	3.88	8.59	2.77	19639.20	4.19	79.88	21.19	1.38	5.99	-0.02	0.14	38.95	107.03	0.22	-0.16	580.30	43.52	2.43	414.87
463	3.88	8.59	2.77	19639.20	4.19	79.79	21.16	1.23	5.33	-0.02	0.12	39.05	126.16	0.16	-0.20	652.86	43.60	2.43	413.15
548	3.88	8.59	2.77	19639.20	4.19	79.96	21.21	1.53	6.62	-0.02	0.15	38.87	92.45	0.26	-0.13	524.98	43.45	2.43	412.37
506	3.88	8.59	2.77	19639.20	4.19	79.74	21.15	1.16	5.05	-0.02	0.12	38.95	135.77	0.26	-0.21	688.90	43.61	2.43	412.04
506	3.88	8.59	2.77	19639.20	4.19	79.85	21.18	1.34	5.80	-0.02	0.13	39.04	112.01	0.15	-0.18	599.35	43.56	2.43	410.98
464	3.88	8.59	2.77	19639.20	4.19	80.12	21.25	1.81	7.80	-0.02	0.18	38.81	71.44	0.28	-0.08	445.44	43.37	2.43	411.04
506	3.88	8.59	2.77	19639.20	4.19	79.87	21.19	1.38	5.98	-0.02	0.14	38.95	107.40	0.22	-0.16	581.70	43.52	2.43	409.21
549	3.88	8.59	2.77	19639.20	4.19	79.94	21.20	1.50	6.50	-0.02	0.15	38.87	94.91	0.27	-0.13	534.25	43.46	2.43	409.76
549	3.88	8.59	2.77	19639.20	4.19	79.99	21.22	1.57	6.77	-0.02	0.16	38.94	89.32	0.19	-0.13	513.35	43.46	2.43	409.32
507	3.88	8.59	2.77	19639.20	4.19	80.04	21.23	1.67	7.20	-0.02	0.17	38.87	81.30	0.24	-0.11	482.84	43.41	2.43	409.54
507	3.88	8.59	2.77	19639.20	4.19	79.85	21.18	1.34	5.82	-0.02	0.13	38.95	111.56	0.22	-0.17	597.41	43.53	2.43	408.98
507	3.88	8.59	2.77	19639.20	4.19	79.84	21.18	1.32	5.72	-0.02	0.13	38.95	114.38	0.23	-0.17	608.06	43.54	2.43	409.04
465	3.88	8.59	2.77	19639.20	4.19	79.76	21.16	1.20	5.19	-0.02	0.12	38.85	130.85	0.34	-0.18	670.04	43.56	2.43	408.37
508	3.88	8.59	2.77	19639.20	4.19	80.08	21.24	1.74	7.50	-0.02	0.17	38.88	76.14	0.23	-0.10	463.35	43.40	2.43	408.43
550	3.88	8.59	2.77	19639.20	4.19	79.92	21.20	1.47	6.35	-0.02	0.15	38.87	98.35	0.27	-0.13	547.26	43.47	2.43	407.93
550	3.88	8.59	2.77	19639.20	4.19	80.02	21.23	1.62	7.01	-0.02	0.16	38.94	84.70	0.19	-0.12	495.90	43.44	2.43	408.93
508	3.88	8.59	2.77	19639.20	4.19	79.94	21.21	1.50	6.47	-0.02	0.15	38.95	95.60	0.20	-0.14	537.08	43.48	2.43	408.26
466	3.88	8.59	2.77	19639.20	4.19	79.93	21.20	1.48	6.39	-0.02	0.15	38.95	97.32	0.20	-0.14	543.58	43.49	2.43	407.93
508	3.88	8.59	2.77	19639.20	4.19	79.99	21.22	1.57	6.78	-0.02	0.16	38.94	89.10	0.19	-0.13	512.51	43.46	2.43	407.98
551	3.88	8.59	2.77	19639.20	4.19	80.02	21.23	1.65	7.11	-0.02	0.16	38.80	82.81	0.31	-0.10	488.36	43.40	2.43	408.59
509	3.88	8.59	2.77	19639.20	4.19	79.91	21.20	1.47	6.33	-0.02	0.15	38.79	98.76	0.34	-0.12	548.60	43.44	2.43	408.59
509	3.88	8.59	2.77	19639.20	4.19	79.90	21.19	1.42	6.14	-0.02	0.14	38.95	103.22	0.21	-0.15	565.88	43.50	2.43	408.48
551	3.88	8.59	2.77	19639.20	4.19	79.78	21.16	1.22	5.30	-0.02	0.12	38.95	126.92	0.25	-0.19	655.46	43.58	2.43	407.87
594	3.88	8.59	2.77	19639.20	4.19	79.92	21.20	1.46	6.32	-0.02	0.15	38.87	98.98	0.28	-0.14	549.65	43.47	2.43	408.71
552	3.88	8.59	2.77	19639.20	4.19	79.92	21.20	1.46	6.30	-0.02	0.14	38.95	99.46	0.21	-0.15	551.68	43.49	2.43	408.71
510	3.88	8.59	2.77	19639.20	4.19	80.05	21.23	1.68	7.27	-0.02	0.17	38.87	80.02	0.24	-0.11	478.01	43.41	2.43	408.04
552	3.88	8.59	2.77	19639.20	4.19	79.95	21.21	1.50	6.50	-0.02	0.15	38.95	94.92	0.20	-0.14	534.53	43.48	2.43	408.32
510	3.88	8.59	2.77	19639.20	4.19	80.01	21.22	1.62	6.99	-0.02	0.16	38.87	85.13	0.25	-0.11	497.30	43.43	2.43	408.48
425	3.88	8.59	2.77	19639.20	4.19	79.97	21.21	1.56	6.73	-0.02	0.15	38.87	90.08	0.26	-0.12	516.04	43.44	2.43	408.21
510	3.88	8.59	2.77	19639.20	4.19	79.75	21.15	1.17	5.05	-0.02	0.12	38.95	135.53	0.26	-0.21	687.99	43.61	2.43	406.26
553	3.88	8.59	2.77	19639.20	4.19	79.90	21.19	1.41	6.09	-0.02	0.14	39.03	104.52	0.14	-0.17	571.02	43.53	2.43	406.82
553	3.88	8.59	2.77	19639.20	4.19	79.88	21.19	1.39	6.03	-0.02	0.14	38.95	105.91	0.22	-0.16	576.04	43.51	2.43	406.98
553	3.88	8.59	2.77	19639.20	4.19	79.87	21.18	1.36	5.89	-0.02	0.14	39.03	109.72	0.15	-0.18	590.67	43.55	2.43	407.87
553	3.88	8.59	2.77	19639.20	4.19	80.11	21.25	1.77	7.64	-0.02	0.18	38.94	73.85	0.17	-0.11	454.88	43.41	2.43	408.59
596	3.88	8.59	2.77	19639.20	4.19	79.76	21.16	1.20	5.19	-0.02	0.12	38.85	130.66	0.34	-0.18	669.32	43.56	2.43	409.21
554	3.88	8.59	2.77	19639.20	4.19	80.07	21.24	1.72	7.42	-0.02	0.17	38.87	77.52	0.23	-0.10	468.57	43.40	2.43	409.54
469	3.88	8.59	2.77	19639.20	4.19	79.97	21.21	1.55	6.68	-0.02	0.15	38.95	91.11	0.20	-0.13	520.13	43.47	2.43	409.76
511	3.88	8.59	2.77	19639.20	4.19	79.77	21.16	1.21	5.26	-0.02	0.12	38.95	128.46	0.25	-0.19	661.27	43.58	2.43	408.43
512	3.88	8.59	2.77	19639.20	4.19	79.84	21.18	1.32	5.72	-0.02	0.13	38.95	114.22	0.23	-0.17	607.47	43.54	2.43	408.09
512	3.88	8.59	2.77	19639.20	4.19	79.85	21.18	1.33	5.75	-0.02	0.13	39.04	113.42	0.15	-0.18	604.66	43.56	2.43	407.15
555	3.88	8.59	2.77	19639.20	4.19	80.04	21.23	1.69	7.27	-0.01	0.17	38.73	79.94	0.36	-0.09	477.35	43.37	2.43	407.93
555	3.88	8.59	2.77	19639.20	4.19	79.85	21.18	1.33	5.77	-0.02	0.13	38.95	112.87	0.23	-0.17	602.34	43.53	2.43	408.54
512	3.88	8.59	2.77	19639.20	4.19	79.93	21.20	1.47	6.37	-0.02	0.15	38.95	97.97	0.20	-0.15	546.03	43.49	2.43	407.93
470	3.88	8.59	2.77	19639.20	4.19	79.93	21.20	1.48	6.38	-0.02	0.15	38.95	97.57	0.20	-0.14	544.52	43.49	2.43	408.04
512	3.88	8.59	2.77	19639.20	4.19	80.01	21.22	1.64	7.08	-0.01	0.16	38.73	83.38	0.37	-0.09	490.33	43.38	2.43	408.54
513	3.88	8.59	2.77	19639.20	4.19	79.80	21.17	1.25	5.43	-0.02	0.12	38.95	122.99	0.24	-0.19	640.59	43.57	2.43	406.93
513	3.88	8.59	2.77	19639.20	4.19	80.01	21.22	1.61	6.95	-0.02	0.16	38.87	85.81	0.25	-0.12	499.91	43.43	2.43	407.82
470	3.88	8.59	2.77	19639.20	4.19	79.80	21.17	1.25	5.41	-0.02	0.12	38.95	123.54	0.24	-0.19	642.69	43.57	2.43	407.15
428	3.88	8.59	2.77	19639.20	4.19	79.95	21.21	1.53	6.60	-0.02	0.15	38.79	92.88	0.33	-0.12	526.39	43.43	2.43	406.87
428	3.88	8.59	2.77	19639.20	4.19	79.76	21.16	1.17	5.09	-0.03	0.12	39.05	134.30	0.17	-0.22	683.63	43.63	2.43	406.76
513	3.88	8.59	2.77	19639.20	4.19	79.83	21.17	1.30	5.61	-0.02	0.13	39.04	117.46	0.16	-0.19	619.95	43.58	2.43	405.93
513	3.88	8.59	2.77	19639.20	4.19	79.92	21.20	1.46	6.30	-0.02	0.15	38.87	99.34	0.28	-0.14	551.00	43.47	2.43	405.93

428	3.88	8.59	2.77	19639.20	4.19	79.76	21.16	1.19	5.16	-0.02	0.12	38.95	131.77	0.25	-0.20	673.78	43.60	2.43	404.93
514	3.88	8.59	2.77	19639.20	4.19	79.84	21.18	1.32	5.70	-0.02	0.13	38.95	114.97	0.23	-0.17	610.30	43.54	2.43	404.76
557	3.88	8.59	2.77	19639.20	4.19	79.67	21.13	1.04	4.52	-0.02	0.10	38.96	157.41	0.29	-0.24	770.70	43.68	2.43	404.59
471	3.88	8.59	2.77	19639.20	4.19	79.90	21.19	1.42	6.15	-0.02	0.14	38.95	102.95	0.21	-0.15	564.86	43.50	2.43	404.93
471	3.88	8.59	2.77	19639.20	4.19	79.75	21.15	1.17	5.07	-0.02	0.12	38.95	135.13	0.26	-0.20	686.48	43.61	2.43	403.65
428	3.88	8.59	2.77	19639.20	4.19	79.79	21.16	1.24	5.38	-0.02	0.12	38.95	124.59	0.24	-0.19	646.67	43.57	2.43	403.98
514	3.88	8.59	2.77	19639.20	4.19	79.81	21.17	1.27	5.50	-0.02	0.13	38.95	120.87	0.24	-0.18	632.58	43.56	2.43	403.09
686	3.88	8.59	2.77	19639.20	4.19	80.00	21.22	1.60	6.89	-0.02	0.16	38.87	86.91	0.25	-0.12	504.07	43.43	2.43	405.26
600	3.88	8.59	2.77	19639.20	4.19	80.06	21.24	1.71	7.37	-0.02	0.17	38.87	78.26	0.24	-0.10	471.37	43.40	2.43	406.54
472	3.88	8.59	2.77	19639.20	4.19	79.89	21.19	1.41	6.08	-0.02	0.14	38.95	104.66	0.21	-0.16	571.33	43.51	2.43	406.43
429	3.88	8.59	2.77	19639.20	4.19	79.74	21.15	1.15	5.01	-0.02	0.11	38.95	137.31	0.26	-0.21	694.71	43.61	2.43	406.26
515	3.88	8.59	2.77	19639.20	4.19	80.00	21.22	1.59	6.86	-0.02	0.16	38.94	87.49	0.19	-0.13	506.42	43.45	2.43	405.71
558	3.88	8.59	2.77	19639.20	4.19	79.80	21.17	1.25	5.41	-0.02	0.12	39.04	123.44	0.16	-0.20	642.55	43.60	2.43	404.82
472	3.88	8.59	2.77	19639.20	4.19	79.93	21.20	1.48	6.39	-0.02	0.15	38.87	97.35	0.27	-0.13	543.48	43.46	2.43	405.98
601	3.88	8.59	2.77	19639.20	4.19	79.83	21.18	1.31	5.68	-0.02	0.13	38.95	115.54	0.23	-0.17	612.45	43.54	2.43	405.43
601	3.88	8.59	2.77	19639.20	4.19	80.05	21.23	1.70	7.32	-0.02	0.17	38.81	79.11	0.30	-0.10	474.41	43.39	2.43	407.15
473	3.88	8.59	2.77	19639.20	4.19	79.78	21.16	1.23	5.32	-0.02	0.12	38.95	126.41	0.25	-0.19	653.54	43.58	2.43	406.48
473	3.88	8.59	2.77	19639.20	4.19	79.98	21.21	1.55	6.71	-0.02	0.15	38.95	90.62	0.19	-0.13	518.25	43.46	2.43	406.26
473	3.88	8.59	2.77	19639.20	4.19	79.82	21.17	1.28	5.55	-0.02	0.13	39.04	119.16	0.16	-0.19	626.38	43.58	2.43	406.09
430	3.88	8.59	2.77	19639.20	4.19	79.85	21.18	1.34	5.82	-0.02	0.13	38.95	111.59	0.22	-0.17	597.52	43.53	2.43	406.98
516	3.88	8.59	2.77	19639.20	4.19	79.81	21.17	1.27	5.48	-0.02	0.13	38.95	121.34	0.24	-0.18	634.37	43.56	2.43	405.26
559	3.88	8.59	2.77	19639.20	4.19	79.78	21.16	1.23	5.32	-0.02	0.12	38.95	126.34	0.25	-0.19	653.27	43.58	2.43	405.54
473	3.88	8.59	2.77	19639.20	4.19	79.84	21.18	1.31	5.67	-0.02	0.13	39.04	115.70	0.15	-0.19	613.28	43.57	2.43	404.93
516	3.88	8.59	2.77	19639.20	4.19	79.96	21.21	1.52	6.57	-0.02	0.15	38.95	93.43	0.20	-0.14	528.87	43.47	2.43	405.37
517	3.88	8.59	2.77	19639.20	4.19	79.80	21.17	1.25	5.43	-0.02	0.12	38.95	122.99	0.24	-0.19	640.59	43.57	2.43	405.59
517	3.88	8.59	2.77	19639.20	4.19	80.12	21.25	1.80	7.78	-0.02	0.18	38.81	71.79	0.28	-0.09	446.76	43.37	2.43	405.59
517	3.88	8.59	2.77	19639.20	4.19	79.76	21.16	1.19	5.16	-0.02	0.12	38.95	131.88	0.25	-0.20	674.22	43.60	2.43	405.21
517	3.88	8.59	2.77	19639.20	4.19	79.97	21.21	1.55	6.69	-0.02	0.15	38.87	90.99	0.26	-0.12	519.44	43.44	2.43	405.65
517	3.88	8.59	2.77	19639.20	4.19	79.90	21.19	1.42	6.16	-0.02	0.14	38.95	102.87	0.21	-0.15	564.56	43.50	2.43	405.87
560	3.88	8.59	2.77	19639.20	4.19	79.87	21.18	1.37	5.92	-0.02	0.14	38.95	108.96	0.22	-0.16	587.57	43.52	2.43	405.21
560	3.88	8.59	2.77	19639.20	4.19	79.76	21.16	1.19	5.15	-0.02	0.12	38.95	132.15	0.25	-0.20	675.23	43.60	2.43	405.65
517	3.88	8.59	2.77	19639.20	4.19	80.08	21.24	1.75	7.54	-0.02	0.17	38.81	75.52	0.29	-0.09	460.84	43.38	2.43	406.59
474	3.88	8.59	2.77	19639.20	4.19	79.97	21.21	1.55	6.69	-0.02	0.15	38.95	91.07	0.20	-0.13	519.96	43.47	2.43	406.09
474	3.88	8.59	2.77	19639.20	4.19	79.83	21.17	1.31	5.65	-0.02	0.13	38.95	116.18	0.23	-0.17	614.85	43.55	2.43	405.15
475	3.88	8.59	2.77	19639.20	4.19	79.84	21.18	1.32	5.72	-0.02	0.13	38.95	114.38	0.23	-0.17	608.06	43.54	2.43	404.71
561	3.88	8.59	2.77	19639.20	4.19	79.94	21.20	1.48	6.42	-0.02	0.15	39.02	96.72	0.14	-0.15	541.52	43.51	2.43	405.15
561	3.88	8.59	2.77	19639.20	4.19	80.01	21.22	1.62	6.99	-0.02	0.16	38.80	85.05	0.31	-0.10	496.83	43.40	2.43	406.26
604	3.88	8.59	2.77	19639.20	4.19	79.98	21.21	1.57	6.76	-0.02	0.16	38.87	89.53	0.26	-0.12	513.93	43.44	2.43	406.32
605	3.88	8.59	2.77	19639.20	4.19	79.89	21.19	1.41	6.10	-0.02	0.14	38.86	104.12	0.28	-0.14	569.05	43.48	2.43	407.48
518	3.88	8.59	2.77	19639.20	4.19	79.91	21.20	1.44	6.23	-0.02	0.14	38.95	101.04	0.21	-0.15	557.65	43.50	2.43	407.82
562	3.88	8.59	2.77	19639.20	4.19	79.74	21.15	1.15	4.99	-0.02	0.11	38.95	138.00	0.26	-0.21	697.34	43.61	2.43	408.43
562	3.88	8.59	2.77	19639.20	4.19	79.91	21.20	1.45	6.27	-0.02	0.14	38.95	100.21	0.21	-0.15	554.50	43.49	2.43	408.26
519	3.88	8.59	2.77	19639.20	4.19	79.91	21.20	1.44	6.23	-0.02	0.14	38.95	101.22	0.21	-0.15	558.34	43.50	2.43	409.32
476	3.88	8.59	2.77	19639.20	4.19	79.85	21.18	1.34	5.80	-0.02	0.13	38.95	111.95	0.23	-0.17	598.89	43.53	2.43	407.87
476	3.88	8.59	2.77	19639.20	4.19	79.99	21.22	1.58	6.81	-0.02	0.16	38.94	88.53	0.19	-0.13	510.36	43.46	2.43	407.32
476	3.88	8.59	2.77	19639.20	4.19	79.81	21.17	1.27	5.50	-0.02	0.13	38.95	120.63	0.24	-0.18	631.68	43.56	2.43	406.76
562	3.88	8.59	2.77	19639.20	4.19	79.73	21.15	1.15	4.97	-0.02	0.11	38.95	138.54	0.26	-0.21	699.36	43.62	2.43	405.98
606	3.88	8.59	2.77	19639.20	4.19	79.82	21.17	1.28	5.56	-0.02	0.13	38.95	118.93	0.24	-0.18	625.26	43.55	2.43	406.37
563	3.88	8.59	2.77	19639.20	4.19	80.00	21.22	1.60	6.89	-0.02	0.16	38.87	86.94	0.25	-0.12	504.15	43.43	2.43	406.98
476	3.88	8.59	2.77	19639.20	4.19	79.86	21.18	1.35	5.83	-0.02	0.13	39.04	111.17	0.15	-0.18	596.16	43.55	2.43	406.93
519	3.88	8.59	2.77	19639.20	4.19	80.16	21.26	1.86	8.04	-0.02	0.19	38.88	67.93	0.22	-0.09	432.35	43.37	2.43	407.32
476	3.88	8.59	2.77	19639.20	4.19	79.71	21.14	1.10	4.77	-0.02	0.11	38.95	146.25	0.27	-0.22	728.51	43.64	2.43	406.59
433	3.88	8.59	2.77	19639.20	4.19	79.99	21.22	1.57	6.79	-0.02	0.16	38.94	88.88	0.19	-0.13	511.68	43.46	2.43	405.15
520	3.88	8.59	2.77	19639.20	4.19	79.68	21.13	1.06	4.58	-0.02	0.11	38.84	154.28	0.38	-0.22	758.56	43.64	2.43	404.04
563	3.88	8.59	2.77	19639.20	4.19	80.01	21.22	1.60	6.93	-0.02	0.16	38.94	86.18	0.19	-0.13	501.50	43.45	2.43	404.59
563	3.88	8.59	2.77	19639.20	4.19	79.79	21.16	1.24	5.38	-0.02	0.12	38.95	124.63	0.24	-0.19	646.80	43.57	2.43	404.82
607	3.88	8.59	2.77	19639.20	4.19	80.01	21.22	1.62	6.99	-0.02	0.16	38.87	85.06	0.25	-0.11	497.07	43.43	2.43	405.15
607	3.88	8.59	2.77	19639.20	4.19	79.99	21.22	1.58	6.83	-0.02	0.16	38.94	88.20	0.19	-0.13	509.12	43.46	2.43	405.87
520	3.88	8.59	2.77	19639.20	4.19	80.16	21.26	1.88	8.12	-0.01	0.19	38.82	66.86	0.27	-0.08	428.13	43.35	2.43	407.37
434	3.88	8.59	2.77	19639.20	4.19	79.81	21.17	1.27	5.51	-0.02	0.13	38.95	120.29	0.24	-0.18	630.42	43.56	2.43	406.76
521	3.88	8.59	2.77	19639.20	4.19	79.82	21.17	1.29	5.60	-0.02	0.13	38.95	117.69	0.23	-0.18	620.56	43.55	2.43	405.76
521	3.88	8.59	2.77	19639.20	4.19	79.78	21.16	1.21	5.26	-0.03	0.12	39.05	128.54	0.17	-0.21	661.82	43.61	2.43	403.21
347	3.88	8.59	2.77	19639.20	4.19	79.82	21.17	1.30	5.63	-0.02	0.13	38.86	116.72	0.31	-0.16	616.66	43.52	2.43	399.71
304	3.88	8.59	2.77	19639.20	4.19	79.68	21.13	1.04	4.53	-0.03	0.10	39.07	156.63	0.19	-0.26	768.04	43.71	2.43	396.15
260	3.88	8.59	2.77	19639.20	4.19	79.71	21.14	1.09	4.74	-0.03	0.11	39.06	147.89	0.18	-0.24	735.00	43.68	2.43	393.65
260	3.88	8.59	2.77	19639.20	4.19	79.73	21.15	1.13	4.91	-0.02	0.11	38.95	140.92	0.27	-0.21	708.38	43.62	2.43	391.09
347	3.88	8.59	2.77	19639.20	4.19	79.49	21.09	0.74	3.25	-0.03	0.07	38.97	238.19	0.41	-0.37	1075.98	43.93	2.43	389.15
391	3.88	8.59	2.77	19639.20	4.19	79.58	21.11	0.88	3.82	-0.03	0.09	39.10	194.80	0.23	-0.32	912.36	43.83	2.43	387.15
174	3.88	8.59	2.77	19639.20	4.19	79.76	21.16	1.19	5.16	-0.02	0.12	38.95	131.73	0.25	-0.20	673.64	43.59	2.43	385.59
261	3.88	8.59	2.77	19639.20	4.19	79.60	21.11	0.91	3.96	-0.03	0.09	39.09	186.35	0.22	-0.30	880.42	43.81	2.43	383.09

478	3.88	8.59	2.77	19639.20	4.19	79.50	21.09	0.76	3.32	-0.03	0.08	38.97	231.46	0.40	-0.36	1050.56	43.91	2.43	382.76
434	3.88	8.59	2.77	19639.20	4.19	79.80	21.17	1.26	5.44	-0.02	0.12	38.95	122.47	0.24	-0.18	638.63	43.57	2.43	383.15
304	3.88	8.59	2.77	19639.20	4.19	79.64	21.12	0.98	4.24	-0.03	0.10	39.08	170.67	0.21	-0.28	821.13	43.75	2.43	382.98
304	3.88	8.59	2.77	19639.20	4.19	79.77	21.16	1.21	5.26	-0.02	0.12	38.95	128.42	0.25	-0.19	661.13	43.58	2.43	381.82
391	3.88	8.59	2.77	19639.20	4.19	79.59	21.11	0.89	3.87	-0.03	0.09	39.09	191.73	0.23	-0.31	900.77	43.82	2.43	380.93
435	3.88	8.59	2.77	19639.20	4.19	79.56	21.10	0.85	3.71	-0.03	0.08	39.10	202.45	0.24	-0.33	941.29	43.86	2.43	380.04
304	3.88	8.59	2.77	19639.20	4.19	79.81	21.17	1.26	5.45	-0.02	0.13	39.04	122.23	0.16	-0.20	637.98	43.59	2.43	380.59
130	3.88	8.59	2.77	19639.20	4.19	79.74	21.15	1.15	4.98	-0.03	0.11	39.05	138.46	0.18	-0.22	699.35	43.65	2.43	379.71
304	3.88	8.59	2.77	19639.20	4.19	79.56	21.10	0.85	3.69	-0.03	0.08	39.10	203.74	0.24	-0.33	946.15	43.86	2.43	378.09
304	3.88	8.59	2.77	19639.20	4.19	79.57	21.11	0.86	3.74	-0.03	0.09	39.10	200.51	0.23	-0.33	933.96	43.85	2.43	377.48
348	3.88	8.59	2.77	19639.20	4.19	79.81	21.17	1.29	5.59	-0.02	0.13	38.77	117.82	0.39	-0.15	620.57	43.50	2.43	376.98
435	3.88	8.59	2.77	19639.20	4.19	79.57	21.11	0.86	3.73	-0.03	0.09	39.10	200.66	0.23	-0.33	934.52	43.85	2.43	377.37
261	3.88	8.59	2.77	19639.20	4.19	79.69	21.14	1.07	4.64	-0.03	0.11	39.06	151.85	0.19	-0.25	749.98	43.69	2.43	376.87
348	3.88	8.59	2.77	19639.20	4.19	79.67	21.13	1.02	4.45	-0.03	0.10	39.19	160.51	0.10	-0.28	783.03	43.75	2.43	376.76
348	3.88	8.59	2.77	19639.20	4.19	79.65	21.13	0.99	4.30	-0.03	0.10	39.08	167.63	0.20	-0.27	809.63	43.74	2.43	375.82
304	3.88	8.59	2.77	19639.20	4.19	79.62	21.12	0.95	4.13	-0.03	0.09	39.08	176.54	0.21	-0.29	843.31	43.77	2.43	375.48
435	3.88	8.59	2.77	19639.20	4.19	79.56	21.10	0.84	3.66	-0.03	0.08	39.24	205.85	0.12	-0.36	954.51	43.91	2.43	374.71
435	3.88	8.59	2.77	19639.20	4.19	79.67	21.13	1.03	4.46	-0.03	0.10	39.18	160.15	0.10	-0.28	781.66	43.75	2.43	374.26
305	3.88	8.59	2.77	19639.20	4.19	79.72	21.15	1.11	4.83	-0.03	0.11	39.06	144.22	0.18	-0.23	721.11	43.66	2.43	375.09
261	3.88	8.59	2.77	19639.20	4.19	79.71	21.14	1.10	4.79	-0.02	0.11	38.95	145.76	0.27	-0.22	726.64	43.64	2.43	375.43
305	3.88	8.59	2.77	19639.20	4.19	79.67	21.13	1.02	4.45	-0.03	0.10	39.07	160.65	0.20	-0.26	783.24	43.72	2.43	375.54
261	3.88	8.59	2.77	19639.20	4.19	79.59	21.11	0.89	3.89	-0.03	0.09	39.22	190.88	0.11	-0.33	897.88	43.86	2.43	374.82
305	3.88	8.59	2.77	19639.20	4.19	79.62	21.12	0.94	4.09	-0.03	0.09	39.21	179.19	0.11	-0.31	853.66	43.82	2.43	374.15
348	3.88	8.59	2.77	19639.20	4.19	79.62	21.12	0.95	4.15	-0.03	0.09	38.96	175.43	0.32	-0.27	838.80	43.73	2.43	374.04
305	3.88	8.59	2.77	19639.20	4.19	79.79	21.16	1.24	5.36	-0.02	0.12	38.95	125.27	0.24	-0.19	649.21	43.57	2.43	374.98
261	3.88	8.59	2.77	19639.20	4.19	79.49	21.08	0.73	3.19	-0.03	0.07	38.97	243.20	0.41	-0.38	1094.92	43.95	2.43	373.76
348	3.88	8.59	2.77	19639.20	4.19	79.40	21.06	0.61	2.66	-0.03	0.06	38.59	301.31	0.83	-0.41	1313.50	44.03	2.43	372.26
436	3.88	8.59	2.77	19639.20	4.19	79.71	21.14	1.10	4.78	-0.03	0.11	39.06	146.26	0.18	-0.24	728.83	43.67	2.43	372.98
348	3.88	8.59	2.77	19639.20	4.19	79.72	21.15	1.12	4.86	-0.03	0.11	39.06	142.73	0.18	-0.23	715.50	43.66	2.43	373.54
261	3.88	8.59	2.77	19639.20	4.19	79.82	21.17	1.30	5.60	-0.02	0.13	38.86	117.56	0.31	-0.16	619.83	43.52	2.43	373.43
261	3.88	8.59	2.77	19639.20	4.19	79.59	21.11	0.90	3.93	-0.03	0.09	39.09	188.21	0.22	-0.31	887.44	43.81	2.43	373.26
305	3.88	8.59	2.77	19639.20	4.19	79.68	21.13	1.04	4.52	-0.03	0.10	39.07	157.18	0.19	-0.26	770.12	43.71	2.43	373.09
261	3.88	8.59	2.77	19639.20	4.19	79.48	21.08	0.72	3.17	-0.03	0.07	38.97	245.36	0.42	-0.38	1103.07	43.96	2.43	373.09
218	3.88	8.59	2.77	19639.20	4.19	79.64	21.12	0.97	4.23	-0.03	0.10	39.08	171.42	0.21	-0.28	823.94	43.76	2.43	371.76
392	3.88	8.59	2.77	19639.20	4.19	79.54	21.10	0.81	3.53	-0.03	0.08	39.25	214.98	0.12	-0.37	989.05	43.94	2.43	370.59
436	3.88	8.59	2.77	19639.20	4.19	79.53	21.10	0.79	3.47	-0.03	0.08	39.26	219.89	0.13	-0.38	1007.61	43.96	2.43	370.82
218	3.88	8.59	2.77	19639.20	4.19	79.75	21.15	1.17	5.07	-0.03	0.12	39.05	135.14	0.17	-0.22	686.77	43.63	2.43	370.54
174	3.88	8.59	2.77	19639.20	4.19	79.56	21.10	0.84	3.68	-0.03	0.08	39.24	204.16	0.12	-0.35	948.12	43.90	2.43	369.82
392	3.88	8.59	2.77	19639.20	4.19	79.80	21.17	1.26	5.46	-0.02	0.13	38.86	121.82	0.32	-0.17	635.92	43.54	2.43	369.98
305	3.88	8.59	2.77	19639.20	4.19	79.62	21.12	0.93	4.06	-0.03	0.09	39.21	180.80	0.11	-0.31	859.77	43.82	2.43	370.37
305	3.88	8.59	2.77	19639.20	4.19	79.70	21.14	1.07	4.67	-0.03	0.11	39.06	150.86	0.19	-0.25	746.22	43.69	2.43	370.21
392	3.88	8.59	2.77	19639.20	4.19	79.57	21.11	0.86	3.73	-0.03	0.09	39.10	200.59	0.23	-0.33	934.24	43.85	2.43	370.59
262	3.88	8.59	2.77	19639.20	4.19	79.80	21.17	1.25	5.43	-0.02	0.12	38.95	122.81	0.24	-0.19	639.94	43.57	2.43	370.82
305	3.88	8.59	2.77	19639.20	4.19	79.68	21.13	1.04	4.53	-0.03	0.10	39.07	156.88	0.19	-0.26	768.98	43.71	2.43	370.26
349	3.88	8.59	2.77	19639.20	4.19	79.43	21.07	0.64	2.80	-0.03	0.06	38.98	283.93	0.47	-0.44	1248.86	44.08	2.43	369.37
349	3.88	8.59	2.77	19639.20	4.19	79.58	21.11	0.87	3.79	-0.03	0.09	39.23	197.19	0.12	-0.34	921.77	43.88	2.43	369.54
262	3.88	8.59	2.77	19639.20	4.19	79.73	21.15	1.14	4.93	-0.03	0.11	39.06	140.05	0.18	-0.23	705.34	43.65	2.43	370.09
349	3.88	8.59	2.77	19639.20	4.19	79.68	21.13	1.04	4.52	-0.03	0.10	39.07	157.28	0.19	-0.26	770.50	43.71	2.43	369.43
480	3.88	8.59	2.77	19639.20	4.19	79.72	21.15	1.13	4.88	-0.02	0.11	38.95	141.91	0.27	-0.22	712.09	43.63	2.43	370.82
349	3.88	8.59	2.77	19639.20	4.19	79.86	21.18	1.37	5.93	-0.02	0.14	38.78	108.50	0.37	-0.14	585.38	43.47	2.43	371.71
306	3.88	8.59	2.77	19639.20	4.19	79.61	21.12	0.94	4.10	-0.02	0.09	38.83	178.24	0.43	-0.26	849.09	43.71	2.43	372.15
393	3.88	8.59	2.77	19639.20	4.19	79.61	21.12	0.92	4.02	-0.03	0.09	39.09	182.80	0.22	-0.30	866.97	43.79	2.43	372.43
349	3.88	8.59	2.77	19639.20	4.19	79.81	21.17	1.28	5.53	-0.02	0.13	38.86	119.66	0.31	-0.17	627.77	43.53	2.43	373.59
306	3.88	8.59	2.77	19639.20	4.19	79.60	21.11	0.91	3.98	-0.03	0.09	39.09	185.37	0.22	-0.30	876.71	43.80	2.43	372.98
480	3.88	8.59	2.77	19639.20	4.19	79.74	21.15	1.16	5.01	-0.02	0.11	38.95	137.10	0.26	-0.21	693.94	43.61	2.43	373.15
262	3.88	8.59	2.77	19639.20	4.19	79.65	21.13	1.00	4.36	-0.03	0.10	39.07	164.62	0.20	-0.27	798.25	43.73	2.43	374.09
87	3.88	8.59	2.77	19639.20	4.19	79.55	21.10	0.84	3.68	-0.03	0.08	38.96	204.15	0.36	-0.31	947.34	43.83	2.43	372.87
437	3.88	8.59	2.77	19639.20	4.19	79.56	21.10	0.86	3.74	-0.03	0.09	38.96	200.40	0.35	-0.31	933.15	43.81	2.43	373.15
480	3.88	8.59	2.77	19639.20	4.19	79.56	21.10	0.84	3.67	-0.03	0.08	39.10	204.81	0.24	-0.34	950.19	43.87	2.43	373.09
306	3.88	8.59	2.77	19639.20	4.19	79.77	21.16	1.21	5.26	-0.02	0.12	38.95	128.35	0.25	-0.19	660.85	43.58	2.43	373.93
175	3.88	8.59	2.77	19639.20	4.19	79.73	21.15	1.13	4.88	-0.03	0.11	39.06	142.00	0.18	-0.23	712.73	43.66	2.43	374.15
87	3.88	8.59	2.77	19639.20	4.19	79.64	21.12	0.97	4.23	-0.03	0.10	39.08	171.24	0.21	-0.28	823.29	43.76	2.43	373.54
262	3.88	8.59	2.77	19639.20	4.19	79.46	21.08	0.68	2.99	-0.03	0.07	39.14	263.13	0.29	-0.43	1170.69	44.06	2.43	370.82
437	3.88	8.59	2.77	19639.20	4.19	79.44	21.07	0.66	2.88	-0.03	0.07	38.97	274.52	0.46	-0.43	1213.27	44.05	2.43	370.26
350	3.88	8.59	2.77	19639.20	4.19	79.50	21.09	0.75	3.27	-0.03	0.07	38.97	235.65	0.40	-0.37	1066.40	43.93	2.43	370.09
350	3.88	8.59	2.77	19639.20	4.19	79.75	21.15	1.17	5.05	-0.03	0.12	39.05	135.58	0.17	-0.22	688.44	43.64	2.43	369.93
350	3.88	8.59	2.77	19639.20	4.19	79.47	21.08	0.72	3.13	-0.03	0.07	38.81	248.74	0.56	-0.36	1115.40	43.92	2.43	369.09
350	3.88	8.59	2.77	19639.20	4.19	79.51	21.09	0.76	3.32	-0.03	0.08	39.28	232.34	0.13	-0.40	1054.72	44.00	2.43	368.98
350	3.88	8.59	2.77	19639.20	4.19	79.60	21.11	0.91	3.95	-0.03	0.09	39.09	187.15	0.22	-0.31	883.42	43.81	2.43	369.76
306	3.88	8.59	2.77	19639.20	4.19	79.83	21.17	1.32	5.71	-0.02	0.13	38.77	114.57	0.38	-0.15	608.30	43.49	2.43	370.26

394	3.88	8.59	2.77	19639.20	4.19	79.45	21.07	0.66	2.91	-0.03	0.07	38.97	271.90	0.45	-0.42	1203.40	44.04	2.43	369.59
262	3.88	8.59	2.77	19639.20	4.19	79.74	21.15	1.14	4.95	-0.03	0.11	39.06	139.33	0.18	-0.23	702.65	43.65	2.43	370.76
306	3.88	8.59	2.77	19639.20	4.19	79.77	21.16	1.21	5.24	-0.02	0.12	38.95	128.94	0.25	-0.19	663.09	43.59	2.43	371.26
437	3.88	8.59	2.77	19639.20	4.19	79.55	21.10	0.85	3.68	-0.03	0.08	38.96	203.92	0.36	-0.31	946.47	43.83	2.43	371.76
262	3.88	8.59	2.77	19639.20	4.19	79.67	21.13	1.03	4.47	-0.03	0.10	39.07	159.77	0.20	-0.26	779.92	43.72	2.43	371.98
306	3.88	8.59	2.77	19639.20	4.19	79.60	21.12	0.92	4.01	-0.03	0.09	39.09	183.69	0.22	-0.30	870.35	43.80	2.43	371.76
394	3.88	8.59	2.77	19639.20	4.19	79.55	21.10	0.83	3.63	-0.03	0.08	39.10	208.07	0.24	-0.34	962.51	43.88	2.43	372.87
306	3.88	8.59	2.77	19639.20	4.19	79.88	21.19	1.40	6.05	-0.02	0.14	38.95	105.43	0.22	-0.16	574.25	43.51	2.43	372.93
263	3.88	8.59	2.77	19639.20	4.19	79.48	21.08	0.72	3.16	-0.03	0.07	38.97	245.88	0.42	-0.38	1105.03	43.96	2.43	371.54
219	3.88	8.59	2.77	19639.20	4.19	79.44	21.07	0.65	2.86	-0.03	0.06	39.15	277.78	0.31	-0.46	1226.10	44.11	2.43	370.37
350	3.88	8.59	2.77	19639.20	4.19	79.58	21.11	0.87	3.82	-0.03	0.09	39.23	195.41	0.11	-0.34	915.01	43.87	2.43	369.26
394	3.88	8.59	2.77	19639.20	4.19	79.71	21.14	1.11	4.83	-0.02	0.11	38.95	144.16	0.27	-0.22	720.62	43.63	2.43	370.48
350	3.88	8.59	2.77	19639.20	4.19	79.55	21.10	0.84	3.68	-0.03	0.08	38.96	204.15	0.36	-0.31	947.34	43.83	2.43	369.82
350	3.88	8.59	2.77	19639.20	4.19	79.61	21.12	0.92	4.02	-0.03	0.09	39.09	182.86	0.22	-0.30	867.21	43.79	2.43	371.04
350	3.88	8.59	2.77	19639.20	4.19	79.72	21.15	1.12	4.86	-0.02	0.11	38.95	142.94	0.27	-0.22	716.00	43.63	2.43	371.43
394	3.88	8.59	2.77	19639.20	4.19	79.51	21.09	0.76	3.31	-0.03	0.08	39.12	232.37	0.27	-0.38	1054.42	43.96	2.43	371.21
306	3.88	8.59	2.77	19639.20	4.19	79.71	21.14	1.09	4.74	-0.03	0.11	39.06	147.62	0.18	-0.24	733.96	43.68	2.43	372.71
350	3.88	8.59	2.77	19639.20	4.19	79.77	21.16	1.22	5.26	-0.02	0.12	38.85	128.20	0.33	-0.18	660.02	43.56	2.43	372.32
219	3.88	8.59	2.77	19639.20	4.19	79.51	21.09	0.76	3.33	-0.03	0.08	38.97	230.99	0.40	-0.36	1048.79	43.91	2.43	371.65
175	3.88	8.59	2.77	19639.20	4.19	79.59	21.11	0.90	3.92	-0.03	0.09	39.09	188.81	0.22	-0.31	889.72	43.81	2.43	371.32
394	3.88	8.59	2.77	19639.20	4.19	79.61	21.12	0.92	4.02	-0.03	0.09	39.09	182.80	0.22	-0.30	866.97	43.79	2.43	369.71
263	3.88	8.59	2.77	19639.20	4.19	79.43	21.07	0.63	2.77	-0.03	0.06	38.98	287.83	0.48	-0.45	1263.60	44.09	2.43	370.26
219	3.88	8.59	2.77	19639.20	4.19	79.76	21.16	1.18	5.12	-0.03	0.12	39.05	133.36	0.17	-0.22	680.06	43.63	2.43	370.59
438	3.88	8.59	2.77	19639.20	4.19	79.63	21.12	0.97	4.21	-0.03	0.10	39.08	172.57	0.21	-0.28	828.31	43.76	2.43	370.48
350	3.88	8.59	2.77	19639.20	4.19	79.68	21.14	1.05	4.57	-0.03	0.10	39.07	154.95	0.19	-0.25	761.67	43.70	2.43	371.59
219	3.88	8.59	2.77	19639.20	4.19	79.67	21.13	1.04	4.53	-0.02	0.10	38.96	156.56	0.29	-0.24	767.49	43.67	2.43	371.21
307	3.88	8.59	2.77	19639.20	4.19	79.61	21.12	0.92	4.02	-0.03	0.09	39.09	182.67	0.22	-0.30	866.49	43.79	2.43	371.15
351	3.88	8.59	2.77	19639.20	4.19	79.50	21.09	0.74	3.24	-0.03	0.07	39.29	238.82	0.14	-0.42	1079.22	44.03	2.43	370.98
351	3.88	8.59	2.77	19639.20	4.19	79.55	21.10	0.83	3.62	-0.03	0.08	39.10	208.30	0.24	-0.34	963.41	43.88	2.43	371.32
351	3.88	8.59	2.77	19639.20	4.19	79.71	21.14	1.10	4.78	-0.03	0.11	39.06	146.08	0.18	-0.24	728.15	43.67	2.43	371.32
307	3.88	8.59	2.77	19639.20	4.19	79.66	21.13	1.01	4.40	-0.03	0.10	39.07	163.01	0.20	-0.27	792.18	43.73	2.43	370.87
351	3.88	8.59	2.77	19639.20	4.19	79.61	21.12	0.92	4.02	-0.03	0.09	39.09	182.73	0.22	-0.30	866.73	43.79	2.43	370.65
395	3.88	8.59	2.77	19639.20	4.19	79.65	21.13	1.00	4.35	-0.03	0.10	38.96	165.20	0.30	-0.25	800.11	43.70	2.43	370.87
351	3.88	8.59	2.77	19639.20	4.19	79.46	21.08	0.69	3.03	-0.03	0.07	38.97	259.24	0.44	-0.40	1155.53	44.00	2.43	369.82
307	3.88	8.59	2.77	19639.20	4.19	79.72	21.15	1.11	4.82	-0.03	0.11	39.06	144.57	0.18	-0.23	722.44	43.67	2.43	370.65
175	3.88	8.59	2.77	19639.20	4.19	79.54	21.10	0.81	3.54	-0.03	0.08	39.11	214.02	0.25	-0.35	985.03	43.90	2.43	370.09
263	3.88	8.59	2.77	19639.20	4.19	79.52	21.09	0.79	3.43	-0.03	0.08	39.12	222.80	0.26	-0.37	1018.20	43.93	2.43	369.32
439	3.88	8.59	2.77	19639.20	4.19	79.66	21.13	1.01	4.40	-0.03	0.10	39.07	163.01	0.20	-0.27	792.18	43.73	2.43	368.71
351	3.88	8.59	2.77	19639.20	4.19	79.83	21.17	1.31	5.67	-0.02	0.13	38.86	115.64	0.31	-0.16	612.57	43.52	2.43	371.48
263	3.88	8.59	2.77	19639.20	4.19	79.58	21.11	0.87	3.80	-0.03	0.09	39.10	196.37	0.23	-0.32	918.27	43.84	2.43	370.93
395	3.88	8.59	2.77	19639.20	4.19	79.69	21.14	1.07	4.64	-0.03	0.11	39.06	151.76	0.19	-0.25	749.62	43.69	2.43	370.15
351	3.88	8.59	2.77	19639.20	4.19	79.38	21.06	0.58	2.55	-0.02	0.06	38.18	315.43	1.20	-0.38	1365.75	43.95	2.43	371.37
395	3.88	8.59	2.77	19639.20	4.19	79.68	21.14	1.05	4.57	-0.03	0.10	39.07	155.24	0.19	-0.25	762.79	43.70	2.43	371.09
395	3.88	8.59	2.77	19639.20	4.19	79.62	21.12	0.94	4.09	-0.03	0.09	39.21	178.94	0.11	-0.31	852.73	43.82	2.43	370.87
176	3.88	8.59	2.77	19639.20	4.19	79.63	21.12	0.96	4.18	-0.03	0.10	39.08	174.09	0.21	-0.28	834.07	43.76	2.43	371.82
307	3.88	8.59	2.77	19639.20	4.19	79.69	21.14	1.07	4.66	-0.02	0.11	38.95	151.08	0.28	-0.23	746.77	43.66	2.43	371.48
439	3.88	8.59	2.77	19639.20	4.19	79.64	21.13	0.99	4.29	-0.03	0.10	39.08	168.41	0.20	-0.27	812.58	43.75	2.43	371.54
351	3.88	8.59	2.77	19639.20	4.19	79.56	21.10	0.85	3.69	-0.03	0.08	39.10	203.59	0.24	-0.33	945.57	43.86	2.43	371.09
351	3.88	8.59	2.77	19639.20	4.19	79.50	21.09	0.74	3.25	-0.03	0.07	39.13	237.87	0.27	-0.39	1075.18	43.98	2.43	371.15
395	3.88	8.59	2.77	19639.20	4.19	79.86	21.18	1.37	5.93	-0.02	0.14	38.86	108.61	0.29	-0.15	586.04	43.50	2.43	372.71
307	3.88	8.59	2.77	19639.20	4.19	79.65	21.13	1.00	4.34	-0.03	0.10	39.07	165.92	0.20	-0.27	803.18	43.74	2.43	372.82
219	3.88	8.59	2.77	19639.20	4.19	79.53	21.10	0.80	3.49	-0.03	0.08	39.11	218.29	0.25	-0.36	1001.18	43.91	2.43	372.26
307	3.88	8.59	2.77	19639.20	4.19	79.62	21.12	0.95	4.12	-0.03	0.09	38.96	177.05	0.32	-0.27	844.93	43.74	2.43	371.71
351	3.88	8.59	2.77	19639.20	4.19	79.54	21.10	0.81	3.52	-0.03	0.08	39.11	216.18	0.25	-0.35	993.20	43.91	2.43	372.21
263	3.88	8.59	2.77	19639.20	4.19	79.75	21.15	1.17	5.07	-0.03	0.12	39.05	135.10	0.17	-0.22	686.62	43.63	2.43	372.98
395	3.88	8.59	2.77	19639.20	4.19	79.57	21.11	0.87	3.79	-0.03	0.09	39.10	196.87	0.23	-0.32	920.17	43.84	2.43	371.98
395	3.88	8.59	2.77	19639.20	4.19	79.62	21.12	0.94	4.10	-0.03	0.09	39.08	178.48	0.21	-0.29	850.66	43.78	2.43	372.59
351	3.88	8.59	2.77	19639.20	4.19	79.65	21.13	1.00	4.34	-0.03	0.10	38.96	165.47	0.30	-0.25	801.14	43.70	2.43	373.26
395	3.88	8.59	2.77	19639.20	4.19	79.56	21.10	0.85	3.71	-0.03	0.08	39.10	202.08	0.24	-0.33	939.87	43.86	2.43	374.32
220	3.88	8.59	2.77	19639.20	4.19	79.55	21.10	0.83	3.63	-0.03	0.08	39.10	208.15	0.24	-0.34	962.81	43.88	2.43	373.71
176	3.88	8.59	2.77	19639.20	4.19	79.69	21.14	1.06	4.61	-0.03	0.11	39.07	153.34	0.19	-0.25	755.60	43.70	2.43	372.76
351	3.88	8.59	2.77	19639.20	4.19	79.44	21.07	0.65	2.84	-0.03	0.06	39.16	279.59	0.31	-0.46	1232.91	44.12	2.43	371.71
395	3.88	8.59	2.77	19639.20	4.19	79.69	21.14	1.06	4.60	-0.03	0.11	39.07	153.53	0.19	-0.25	756.33	43.70	2.43	371.93
220	3.88	8.59	2.77	19639.20	4.19	79.81	21.17	1.29	5.56	-0.02	0.13	38.86	118.80	0.31	-0.17	624.52	43.53	2.43	372.71
220	3.88	8.59	2.77	19639.20	4.19	79.49	21.08	0.74	3.21	-0.03	0.07	38.97	241.08	0.41	-0.37	1086.88	43.94	2.43	370.71
439	3.88	8.59	2.77	19639.20	4.19	79.47	21.08	0.71	3.10	-0.03	0.07	38.97	251.38	0.42	-0.39	1125.83	43.98	2.43	369.87
395	3.88	8.59	2.77	19639.20	4.19	79.64	21.13	0.98	4.27	-0.03	0.10	39.08	169.08	0.20	-0.28	815.12	43.75	2.43	369.87
308	3.88	8.59	2.77	19639.20	4.19	79.50	21.09	0.74	3.25	-0.03	0.07	39.13	238.46	0.27	-0.39	1077.41	43.98	2.43	369.04
352	3.88	8.59	2.77	19639.20	4.19	79.57	21.11	0.86	3.74	-0.03	0.09	39.24	200.33	0.12	-0.35	933.64	43.89	2.43	369.04
352	3.88	8.59	2.77	19639.20	4.19	79.55	21.10	0.83	3.64	-0.03	0.08	39.10	207.28	0.24	-0.34	959.55	43.88	2.43	369.54

396	3.88	8.59	2.77	19639.20	4.19	79.76	21.16	1.20	5.19	-0.02	0.12	38.95	130.89	0.25	-0.20	670.46	43.59	2.43	370.32
352	3.88	8.59	2.77	19639.20	4.19	79.47	21.08	0.70	3.08	-0.03	0.07	38.97	253.66	0.43	-0.39	1134.45	43.98	2.43	371.04
220	3.88	8.59	2.77	19639.20	4.19	79.73	21.15	1.14	4.95	-0.02	0.11	38.95	139.49	0.26	-0.21	702.97	43.62	2.43	372.09
264	3.88	8.59	2.77	19639.20	4.19	79.58	21.11	0.87	3.80	-0.03	0.09	39.10	196.44	0.23	-0.32	918.54	43.84	2.43	372.09
440	3.88	8.59	2.77	19639.20	4.19	79.53	21.09	0.79	3.44	-0.03	0.08	39.11	222.27	0.26	-0.36	1016.21	43.93	2.43	372.43
352	3.88	8.59	2.77	19639.20	4.19	79.65	21.13	1.00	4.33	-0.03	0.10	39.07	166.14	0.20	-0.27	804.00	43.74	2.43	373.54
264	3.88	8.59	2.77	19639.20	4.19	79.68	21.13	1.05	4.55	-0.02	0.10	38.96	155.92	0.29	-0.24	765.04	43.67	2.43	372.76
352	3.88	8.59	2.77	19639.20	4.19	79.52	21.09	0.78	3.39	-0.03	0.08	39.12	225.73	0.26	-0.37	1029.31	43.94	2.43	372.09
308	3.88	8.59	2.77	19639.20	4.19	79.49	21.08	0.72	3.17	-0.03	0.07	39.13	245.43	0.28	-0.40	1103.79	44.00	2.43	372.43
396	3.88	8.59	2.77	19639.20	4.19	79.91	21.20	1.46	6.29	-0.02	0.14	38.79	99.68	0.35	-0.13	552.06	43.45	2.43	373.93
396	3.88	8.59	2.77	19639.20	4.19	79.51	21.09	0.80	3.46	-0.02	0.08	38.52	219.45	0.76	-0.28	1003.95	43.75	2.43	373.37
176	3.88	8.59	2.77	19639.20	4.19	79.73	21.15	1.14	4.94	-0.02	0.11	38.95	139.66	0.26	-0.21	703.61	43.62	2.43	373.15
220	3.88	8.59	2.77	19639.20	4.19	79.59	21.11	0.89	3.89	-0.03	0.09	39.22	190.54	0.11	-0.33	896.59	43.86	2.43	372.37
440	3.88	8.59	2.77	19639.20	4.19	79.66	21.13	1.02	4.42	-0.03	0.10	38.96	161.68	0.30	-0.25	786.81	43.69	2.43	372.09
396	3.88	8.59	2.77	19639.20	4.19	79.62	21.12	0.95	4.14	-0.03	0.09	39.08	175.94	0.21	-0.29	841.03	43.77	2.43	372.76
308	3.88	8.59	2.77	19639.20	4.19	79.64	21.13	0.98	4.28	-0.03	0.10	39.08	169.03	0.20	-0.28	814.91	43.75	2.43	372.15
352	3.88	8.59	2.77	19639.20	4.19	79.52	21.09	0.78	3.40	-0.03	0.08	39.12	224.93	0.26	-0.37	1026.26	43.93	2.43	372.71
308	3.88	8.59	2.77	19639.20	4.19	79.62	21.12	0.95	4.15	-0.03	0.09	39.08	175.58	0.21	-0.29	839.68	43.77	2.43	372.93
264	3.88	8.59	2.77	19639.20	4.19	79.66	21.13	1.02	4.45	-0.02	0.10	38.96	160.32	0.29	-0.24	781.69	43.69	2.43	372.04
396	3.88	8.59	2.77	19639.20	4.19	79.53	21.10	0.80	3.48	-0.03	0.08	39.11	219.23	0.25	-0.36	1004.73	43.92	2.43	371.15
484	3.88	8.59	2.77	19639.20	4.19	79.60	21.11	0.92	4.00	-0.03	0.09	39.09	184.21	0.22	-0.30	872.30	43.80	2.43	372.32
352	3.88	8.59	2.77	19639.20	4.19	79.85	21.18	1.33	5.77	-0.02	0.13	38.95	112.77	0.23	-0.17	601.99	43.53	2.43	373.48
220	3.88	8.59	2.77	19639.20	4.19	79.51	21.09	0.77	3.36	-0.03	0.08	39.12	228.37	0.26	-0.38	1039.28	43.95	2.43	372.93
308	3.88	8.59	2.77	19639.20	4.19	79.64	21.12	0.97	4.23	-0.03	0.10	39.08	171.19	0.21	-0.28	823.07	43.75	2.43	372.43
352	3.88	8.59	2.77	19639.20	4.19	79.67	21.13	1.04	4.50	-0.03	0.10	39.07	158.19	0.19	-0.26	773.93	43.71	2.43	371.71
352	3.88	8.59	2.77	19639.20	4.19	79.65	21.13	1.00	4.36	-0.03	0.10	38.96	164.87	0.30	-0.25	798.88	43.70	2.43	372.71
396	3.88	8.59	2.77	19639.20	4.19	79.70	21.14	1.10	4.77	-0.02	0.11	38.85	146.33	0.37	-0.21	728.52	43.61	2.43	373.59
308	3.88	8.59	2.77	19639.20	4.19	79.63	21.12	0.97	4.22	-0.03	0.10	39.08	172.05	0.21	-0.28	826.34	43.76	2.43	373.04
264	3.88	8.59	2.77	19639.20	4.19	79.40	21.06	0.60	2.61	-0.03	0.06	38.59	308.06	0.84	-0.42	1339.00	44.05	2.43	372.98
308	3.88	8.59	2.77	19639.20	4.19	79.62	21.12	0.94	4.11	-0.03	0.09	39.08	177.63	0.21	-0.29	847.43	43.78	2.43	373.04
440	3.88	8.59	2.77	19639.20	4.19	79.84	21.18	1.34	5.78	-0.02	0.13	38.77	112.66	0.38	-0.14	601.07	43.48	2.43	374.59
132	3.88	8.59	2.77	19639.20	4.19	79.72	21.15	1.12	4.86	-0.02	0.11	38.95	142.90	0.27	-0.22	715.84	43.63	2.43	374.54

							SUMS							AVERAGE	
4005.63	3025.39	2944.64	2911.45	3832.22	3524.59	293.32	56334.12	136063.49	25017.08	679827.48	-67042.58	747685.87	41655.88	4486.26	37223.36
Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp	Energy Losses (kJ/kg of Dry Fuel) Flue Gas Constituent							Total Loss	Total
CO_2	O_2	CO	N_2	CH_4	H_2O	K	CO_2	O_2	CO	N_2	CH_4	H_2O Comb	H_2O Fuel MC	Rate	Loss
5569.02	4176.72	4058.02	4013.79	5392.50	4854.95	293.43	216.27	205.33	64.51	1450.17	-47.26	2114.16	118.62	4121.80	0.00
5571.36	4178.42	4059.66	4015.41	5394.87	4856.91	293.43	216.95	273.82	45.48	1700.34	-83.99	2118.25	118.63	4389.49	228.98
5548.21	4161.45	4043.27	3999.18	5371.59	4837.33	293.48	215.43	229.95	68.69	1536.97	-55.10	2114.25	118.58	4228.78	174.64
5527.18	4146.12	4028.48	3984.53	5350.27	4819.67	293.48	214.89	276.34	61.22	1703.41	-77.66	2115.95	118.54	4412.68	191.82
5545.43	4159.61	4041.54	3997.46	5368.36	4835.28	293.37	215.61	265.04	59.62	1664.66	-73.68	2116.19	118.57	4366.00	142.35
5529.74	4147.89	4030.17	3986.20	5353.07	4821.68	293.54	215.34	316.88	49.94	1851.63	-99.50	2118.41	118.54	4571.26	168.91
5506.38	4130.86	4013.74	3969.93	5329.39	4802.06	293.54	214.42	267.21	45.12	1668.36	-82.77	2115.74	118.49	4346.57	170.05
5466.69	4101.90	3985.81	3942.26	5289.17	4768.71	293.54	212.89	306.21	49.22	1805.20	-97.00	2115.84	118.41	4510.77	137.26
5462.02	4098.50	3982.52	3939.00	5284.44	4764.78	293.54	212.70	291.97	47.81	1752.92	-92.12	2115.14	118.40	4446.82	144.98
5429.35	4074.66	3959.52	3916.22	5251.36	4737.32	293.54	211.42	261.65	44.92	1638.83	-82.10	2112.86	118.34	4305.93	177.82
5457.57	4095.16	3979.28	3935.80	5280.14	4760.90	293.59	212.23	191.55	50.31	1387.07	-50.69	2110.46	118.39	4019.33	174.72
5506.38	4130.86	4013.74	3969.93	5329.39	4802.06	293.54	213.35	170.66	82.72	1315.63	-24.94	2109.44	118.49	3985.35	181.91
5515.28	4137.53	4020.22	3976.34	5338.00	4809.82	293.43	214.44	256.14	58.62	1628.68	-71.22	2114.82	118.51	4319.98	187.79
5512.72	4135.76	4018.54	3974.67	5335.20	4807.81	293.37	214.67	245.35	42.91	1589.82	-75.12	2115.16	118.51	4251.29	157.09
5533.30	4150.95	4033.24	3989.22	5355.66	4825.38	293.26	214.90	187.19	61.72	1380.06	-42.03	2112.31	118.55	4032.70	122.71
5520.51	4142.09	4024.81	3980.85	5341.67	4815.35	292.98	214.60	333.43	68.82	1910.12	-96.45	2117.81	118.53	4666.86	152.15
5533.63	4152.04	4034.50	3990.42	5354.15	4826.95	292.76	215.48	253.13	43.59	1620.86	-77.46	2116.24	118.55	4290.39	186.51
5547.87	4162.33	4044.40	4000.24	5368.79	4838.77	292.82	216.04	253.98	43.62	1625.68	-77.54	2116.76	118.58	4297.12	149.44
5517.73	4140.25	4023.08	3979.12	5338.45	4813.30	292.87	214.51	298.58	64.22	1783.29	-85.08	2116.48	118.52	4510.53	137.25
5474.83	4109.32	3993.34	3949.64	5294.18	4777.82	292.65	213.20	294.79	48.02	1765.10	-92.84	2115.79	118.44	4462.50	193.99
5468.05	4104.28	3988.46	3944.81	5287.52	4771.98	292.71	212.30	235.89	70.20	1549.09	-57.94	2111.73	118.42	4239.70	184.30
5503.28	4129.90	4013.14	3969.26	5323.40	4801.45	292.76	214.31	313.72	49.76	1837.28	-98.88	2117.47	118.49	4552.16	138.52
5519.17	4141.68	4024.55	3980.56	5339.10	4815.09	292.65	214.58	280.00	61.75	1716.09	-78.96	2115.89	118.53	4427.87	134.74
5473.16	4107.83	3991.83	3948.16	5293.10	4775.99	292.82	213.13	281.85	46.73	1717.83	-88.38	2115.22	118.43	4404.82	134.04
5477.60	4111.16	3995.07	3951.36	5297.40	4779.87	292.76	212.96	275.84	61.46	1695.87	-78.26	2114.29	118.44	4400.60	191.30
5489.49	4119.75	4003.32	3959.55	5309.64	4789.72	292.82	213.76	261.14	44.58	1644.58	-80.92	2115.00	118.46	4316.62	187.65
5506.05	4131.74	4014.87	3970.99	5326.62	4803.50	292.87	214.41	273.32	45.72	1690.80	-84.87	2116.03	118.50	4373.92	133.10
5473.60	4107.96	3991.91	3948.25	5293.95	4776.08	292.93	213.15	285.67	47.11	1731.69	-89.70	2115.37	118.43	4421.72	172.99
5476.59	4109.87	3993.68	3950.02	5297.59	4778.17	293.09	212.93	261.93	59.61	1645.12	-73.70	2113.72	118.44	4338.05	188.58
5486.15	4116.75	4000.29	3956.57	5307.47	4786.06	293.15	213.05	200.69	64.22	1423.35	-46.73	2111.12	118.46	4084.17	168.67
5523.95	4144.14	4026.67	3982.71	5346.18	4817.53	293.26	214.77	263.57	59.55	1656.77	-73.52	2115.40	118.53	4355.08	151.46
5486.81	4116.96	4000.42	3956.72	5308.75	4786.19	293.32	213.33	252.40	58.28	1611.68	-70.41	2113.71	118.46	4297.45	158.79
5500.60	4127.11	4010.24	3966.43	5322.52	4797.91	293.26	213.89	221.10	54.04	1499.74	-59.92	2113.07	118.48	4160.41	144.69
5489.37	4118.73	4002.11	3958.39	5311.54	4788.19	293.37	213.75	233.77	41.86	1544.93	-71.46	2113.91	118.46	4195.23	173.25
5498.71	4125.54	4008.68	3964.90	5321.00	4796.04	293.37	214.13	271.41	45.57	1682.78	-84.35	2115.65	118.48	4363.67	208.66
5484.70	4115.32	3998.82	3955.14	5306.81	4784.27	293.37	213.26	235.58	56.05	1550.30	-64.89	2113.02	118.45	4221.77	137.64
5515.28	4137.53	4020.22	3976.34	5338.00	4809.82	293.43	213.94	180.73	72.88	1353.81	-33.93	2110.76	118.51	4016.70	157.15
5564.57	4173.38	4054.78	4010.58	5388.19	4851.07	293.48	215.85	183.38	73.10	1369.42	-34.25	2112.58	118.61	4038.69	175.57
5569.47	4176.86	4058.11	4013.88	5393.36	4855.04	293.54	216.23	247.39	71.42	1602.81	-60.20	2115.58	118.62	4311.84	159.32
5576.71	4182.04	4063.08	4018.81	5400.91	4860.97	293.59	217.16	262.33	44.32	1659.19	-79.99	2117.99	118.64	4339.65	160.35
5558.23	4168.48	4049.98	4005.84	5382.37	4845.31	293.65	216.10	266.88	59.78	1672.76	-74.10	2116.67	118.60	4376.70	180.75
5581.83	4185.59	4066.46	4022.17	5406.53	4864.98	293.71	217.03	262.25	59.04	1658.81	-72.24	2117.32	118.65	4360.85	170.61
5572.70	4178.84	4059.92	4015.70	5397.47	4857.18	293.76	217.01	273.79	45.47	1700.23	-83.97	2118.26	118.63	4389.42	143.11
5567.80	4175.36	4056.59	4012.40	5392.29	4853.21	293.71	216.82	269.84	45.10	1685.31	-82.70	2117.95	118.62	4370.94	16.76
5560.79	4170.25	4051.66	4007.51	5385.17	4847.32	293.71	216.22	228.29	54.69	1532.97	-61.51	2115.39	118.60	4204.66	41.07
5544.65	4158.39	4040.20	3996.16	5369.01	4833.63	293.76	215.56	292.52	63.25	1764.17	-82.67	2117.10	118.57	4488.50	171.34
5514.27	4136.24	4018.84	3975.00	5338.20	4808.12	293.76	214.38	289.89	63.10	1750.92	-82.32	2115.95	118.51	4470.43	151.79
5483.91	4114.10	3997.48	3953.84	5307.43	4782.61	293.76	213.17	348.60	71.14	1960.39	-102.19	2117.01	118.45	4726.56	140.49
5472.67	4105.72	3989.35	3945.80	5296.45	4772.89	293.87	212.77	272.52	61.06	1682.76	-77.28	2113.88	118.42	4384.13	158.35

5495.81	4122.68	4005.74	3962.02	5319.69	4792.46	293.82	214.01	249.75	43.43	1603.57	-76.91	2114.69	118.47	4267.01	199.55
5469.68	4103.81	3987.58	3944.03	5292.81	4770.80	293.71	212.99	266.85	45.26	1662.55	-83.26	2114.44	118.42	4337.25	156.84
5465.45	4100.54	3984.38	3940.87	5288.93	4766.96	293.82	212.84	300.06	48.61	1782.61	-94.89	2115.54	118.41	4483.17	133.58
5446.56	4086.85	3971.19	3927.80	5269.59	4751.22	293.76	212.09	253.99	44.07	1613.00	-79.15	2113.14	118.37	4275.51	145.67
5423.45	4069.89	3954.81	3911.58	5246.39	4731.65	293.82	211.20	283.41	47.15	1717.03	-89.83	2113.46	118.32	4400.73	168.77
5442.55	4083.65	3968.03	3924.69	5266.13	4747.43	293.93	211.62	241.17	57.04	1565.25	-67.35	2111.69	118.36	4237.78	171.65
5456.77	4093.93	3977.93	3934.50	5280.74	4759.24	293.98	212.48	228.25	41.44	1520.65	-70.02	2112.50	118.39	4163.69	177.64
5454.44	4092.23	3976.29	3932.87	5278.38	4757.28	293.98	212.40	254.61	44.10	1616.12	-79.25	2113.42	118.39	4279.79	164.43
5449.55	4088.76	3972.96	3929.57	5273.23	4753.31	293.93	211.34	200.93	77.36	1418.90	-40.56	2109.03	118.38	4095.37	139.94
5465.67	4100.61	3984.42	3940.91	5289.35	4767.00	293.87	212.24	211.09	66.09	1458.30	-50.23	2110.68	118.41	4126.57	141.08
5454.22	4092.16	3976.25	3932.82	5277.95	4757.24	293.93	212.05	290.68	63.62	1746.45	-83.60	2113.89	118.39	4461.46	152.60
5461.00	4097.20	3981.13	3937.66	5284.62	4763.08	293.87	212.66	259.18	44.53	1633.56	-80.73	2113.83	118.40	4301.42	119.59
5298.03	3978.13	3866.22	3823.83	5119.93	4625.84	293.93	205.21	188.38	88.47	1354.40	-31.85	2102.57	118.07	4025.26	94.74
5151.54	3871.01	3762.83	3721.42	4972.04	4502.36	293.93	200.64	394.59	60.40	2087.84	-135.90	2108.50	117.77	4833.83	103.45
5005.40	3764.01	3659.50	3619.09	4824.84	4378.95	293.93	194.94	357.83	57.56	1936.48	-126.08	2102.07	117.47	4640.26	119.22
4986.87	3750.43	3646.39	3606.11	4806.20	4363.29	293.93	193.86	300.60	68.54	1725.58	-95.92	2098.13	117.43	4408.22	132.18
4938.45	3714.85	3612.00	3572.06	4757.70	4322.21	293.98	191.68	262.21	79.08	1579.56	-74.75	2094.07	117.33	4249.18	118.36
4878.90	3670.93	3569.51	3529.99	4698.42	4271.43	294.15	189.64	326.62	73.35	1806.80	-107.87	2095.43	117.20	4501.19	115.77
4807.26	3618.36	3518.72	3479.69	4626.51	4210.76	294.15	187.23	387.29	62.45	2019.27	-143.12	2096.60	117.06	4726.76	91.21
4735.71	3565.82	3467.95	3429.42	4554.77	4150.10	294.15	184.91	449.88	46.88	2238.92	-182.55	2098.20	116.91	4953.15	116.86
4701.31	3540.46	3443.43	3405.14	4520.49	4120.80	294.21	182.73	327.32	75.23	1787.64	-112.56	2089.40	116.84	4466.60	124.58
4693.82	3535.20	3438.40	3400.15	4512.46	4114.82	294.04	182.83	479.97	74.23	2342.36	-184.09	2096.83	116.82	5108.95	131.59
4652.16	3504.66	3408.90	3370.93	4470.58	4079.57	293.98	181.60	392.56	42.99	2020.36	-161.34	2092.85	116.74	4685.77	120.73
4652.34	3504.72	3408.94	3370.97	4470.94	4079.61	294.04	180.57	250.39	79.62	1501.57	-75.83	2083.66	116.74	4136.71	97.73
4574.27	3447.22	3353.33	3315.92	4393.03	4013.17	294.09	178.16	370.24	62.56	1928.86	-143.61	2088.05	116.58	4600.84	118.62
4595.16	3462.51	3368.09	3330.54	4414.09	4030.80	294.15	178.60	328.61	76.55	1779.35	-115.88	2085.84	116.62	4449.70	124.33
4576.75	3448.97	3355.00	3317.58	4395.69	4015.16	294.15	178.24	308.06	55.13	1703.08	-117.82	2085.37	116.58	4328.65	120.99
4590.19	3459.01	3364.75	3327.22	4408.77	4026.81	294.04	178.44	281.20	69.10	1606.51	-97.43	2083.69	116.61	4238.12	109.38
4573.53	3446.98	3353.19	3315.76	4391.60	4013.02	293.87	178.13	384.55	64.27	1980.87	-149.54	2088.68	116.58	4663.54	120.41
4573.71	3447.04	3353.22	3315.80	4391.96	4013.06	293.93	178.14	394.27	65.43	2016.19	-153.56	2089.12	116.58	4706.16	121.55
4544.00	3425.10	3331.99	3294.78	4362.44	3987.68	293.98	176.55	448.17	96.21	2207.63	-164.58	2089.19	116.52	4969.70	117.70
4542.07	3423.52	3330.42	3293.24	4360.86	3985.80	294.09	176.57	260.65	66.27	1525.91	-90.43	2081.16	116.51	4136.64	106.91
4523.50	3409.93	3317.30	3280.24	4342.14	3970.12	294.04	175.81	335.36	78.42	1795.15	-120.53	2083.71	116.47	4464.40	125.04
4569.11	3443.66	3349.95	3312.56	4387.36	4009.15	293.93	177.94	291.69	53.24	1642.70	-111.24	2084.41	116.57	4255.30	119.22
4539.40	3421.72	3328.72	3291.54	4357.85	3983.77	293.98	176.79	327.11	57.71	1767.82	-126.77	2084.97	116.51	4404.14	113.94
4525.61	3411.57	3318.90	3281.82	4344.08	3972.04	293.98	176.26	332.00	58.41	1783.92	-129.22	2084.72	116.48	4422.57	104.91
4525.80	3411.62	3318.94	3281.86	4344.43	3972.08	294.04	176.26	303.97	55.04	1682.00	-117.50	2083.47	116.48	4299.71	111.31
4553.20	3431.87	3338.53	3301.26	4371.63	3995.50	293.98	176.67	284.19	87.37	1612.22	-90.42	2081.58	116.53	4268.14	119.74
4551.08	3430.23	3336.93	3299.68	4369.69	3993.58	294.04	176.52	338.77	98.28	1810.19	-110.91	2083.70	116.53	4513.07	116.91
4548.60	3428.48	3335.26	3298.02	4367.04	3991.59	293.98	177.15	353.88	60.84	1866.28	-137.64	2086.48	116.52	4523.51	117.22
4521.20	3408.24	3315.66	3278.62	4339.84	3968.17	294.04	176.10	432.58	70.57	2148.99	-171.44	2089.08	116.47	4862.35	136.54
4555.68	3433.62	3340.20	3302.92	4374.29	3997.49	294.04	177.06	339.87	78.77	1815.46	-121.40	2084.99	116.54	4491.30	135.87
4553.57	3431.98	3338.60	3301.34	4372.35	3995.57	294.09	177.35	341.35	59.30	1821.28	-132.28	2086.07	116.53	4469.60	125.60
4528.09	3413.31	3320.57	3283.48	4346.73	3974.03	294.04	176.02	273.13	68.39	1569.53	-95.69	2081.22	116.48	4189.08	108.70
4541.70	3423.41	3330.35	3293.16	4360.15	3985.72	293.98	176.88	324.96	57.43	1760.28	-125.81	2084.95	116.51	4395.21	123.59
4550.71	3430.12	3336.86	3299.60	4368.98	3993.51	293.93	176.89	291.99	71.19	1640.91	-102.61	2082.80	116.53	4277.69	111.06
4534.99	3418.39	3325.48	3288.34	4353.61	3979.90	294.04	176.27	307.94	73.90	1696.90	-109.33	2082.93	116.50	4345.11	94.04
4456.70	3360.82	3269.83	3233.24	4275.30	3913.41	293.98	173.60	455.49	74.09	2224.43	-183.70	2088.01	116.33	4948.25	128.55
4477.55	3376.10	3284.58	3247.85	4296.26	3931.03	294.04	174.76	352.87	40.92	1854.59	-150.09	2085.18	116.38	4474.60	125.97
4482.32	3379.54	3287.89	3251.13	4301.20	3934.98	294.09	174.58	357.92	61.93	1872.79	-141.47	2084.42	116.39	4526.57	127.48
4519.08	3406.60	3314.06	3277.04	4337.90	3966.25	294.09	176.40	373.76	42.35	1935.64	-157.88	2087.54	116.46	4574.28	128.86
4551.08	3430.23	3336.93	3299.68	4369.69	3993.58	294.04	177.23	253.31	48.78	1500.95	-95.75	2082.07	116.53	4083.12	115.06
4574.27	3447.22	3353.33	3315.92	4393.03	4013.17	294.09	177.73	450.41	96.12	2219.42	-164.33	2090.28	116.58	4986.20	151.37
4585.96	3455.74	3361.55	3324.06	4404.89	4022.98	294.15	178.28	267.89	67.03	1557.56	-92.31	2082.98	116.60	4178.02	117.81
4599.39	3465.78	3371.29	3333.70	4417.97	4034.64	294.04	179.12	315.78	55.87	1733.96	-120.38	2086.50	116.63	4367.48	104.24
4544.19	3425.16	3332.02	3294.82	4362.80	3987.71	294.04	177.00	439.99	71.20	2178.75	-173.64	2090.17	116.52	4899.99	127.62
4528.28	3413.37	3320.61	3283.52	4347.08	3974.07	294.09	176.37	389.88	65.35	1994.63	-153.33	2087.40	116.48	4676.79	121.83
4489.22	3384.61	3292.80	3255.98	4308.08	3940.84	294.09	175.25	383.87	43.36	1968.76	-163.41	2087.03	116.40	4611.25	120.17
4521.38	3408.30	3315.70	3278.66	4340.19	3968.20	294.09	175.14	272.46	102.45	1565.06	-77.89	2079.05	116.47	4232.73	119.52
4544.55	3425.27	3332.09	3294.90	4363.51	3987.79	294.15	177.00	386.60	64.80	1984.64	-151.40	2087.79	116.52	4665.94	131.80
4517.15	3405.03	3312.50	3275.50	4336.31	3964.37	294.21	175.93	333.58	58.68	1788.52	-130.15	2084.49	116.46	4427.50	115.47
4523.86	3410.04	3317.37	3280.32	4342.84	3970.19	294.15	176.19	332.70	58.51	1786.19	-129.58	2084.68	116.47	4425.17	105.83
4546.67	3426.91	3333.69	3296.48	4365.45	3989.71	294.09	176.09	285.74	105.28	1616.37	-82.07	2080.44	116.52	4298.37	112.17
4473.68	3372.94	3281.45	3244.76	4293.08	3927.27	294.26	174.25	414.83	68.94	2078.56	-165.82	2086.70	116.37	4773.82	124.61
4512.56	3401.64	3309.23	3272.26	4331.72	3960.46	294.21	175.41	291.91	71.56	1635.83	-103.54	2081.47	116.45	4269.08	111.47
4484.98	3381.34	3289.60	3252.82	4304.19	3937.00	294.21	174.69	417.74	69.17	2090.56	-166.62	2087.21	116.39	4789.14	114.65
4469.27	3369.62	3278.22	3241.56	4288.85	3923.39	294.32	173.37	312.96	94.24	1706.31	-103.35	2079.84	116.36	4379.74	95.34
4471.02	3371.14	3279.75	3243.07	4290.09	3925.24	294.15	174.60	452.75	49.08	2217.05	-194.68	2089.70	116.36	4904.87	106.80
4436.59	3345.77	3255.22	3218.78	4255.74	3895.93	294.15	173.20	393.00	44.46	1995.47	-169.45	2085.72	116.29	4638.69	121.24
4434.47	3344.14	3253.62	3217.20	4253.79	3894.01	294.21	172.35	332.20	78.94	1772.68	-121.86	2080.54	116.29	4431.15	115.84

4393.17	3313.71	3224.18	3188.06	4212.62	3858.84	294.21	171.12	436.64	72.53	2148.05	-178.33	2085.05	116.20	4851.28	105.71
4386.29	3308.63	3219.28	3183.20	4205.76	3852.98	294.21	170.84	380.40	65.64	1942.72	-154.38	2082.24	116.19	4603.65	120.41
4379.41	3303.56	3214.37	3178.35	4198.91	3847.12	294.21	170.60	520.03	83.06	2449.56	-214.90	2088.45	116.17	5212.99	147.75
4393.17	3313.71	3224.18	3188.06	4212.62	3858.84	294.21	171.10	341.14	60.70	1800.81	-137.23	2080.66	116.20	4433.39	106.35
4342.56	3276.47	3188.18	3152.42	4162.03	3815.83	294.15	169.15	442.75	73.91	2164.07	-183.11	2083.69	116.10	4866.56	116.77
4352.08	3283.34	3194.79	3158.96	4171.84	3823.71	294.26	169.52	409.09	69.58	2042.80	-168.09	2082.43	116.12	4721.44	103.01
4319.65	3259.57	3171.84	3136.23	4139.22	3796.29	294.15	168.25	393.97	68.05	1983.91	-162.77	2080.67	116.05	4648.13	121.73
4406.94	3323.85	3233.99	3197.77	4226.34	3870.56	294.21	171.30	288.89	72.14	1611.89	-105.02	2077.72	116.23	4233.15	147.85
4463.95	3366.01	3274.81	3238.17	4282.87	3919.34	294.09	173.53	263.42	67.41	1526.38	-93.30	2078.59	116.35	4132.38	126.33
4465.71	3367.53	3276.34	3239.67	4284.11	3921.19	293.93	173.93	352.45	61.42	1850.93	-139.69	2083.63	116.35	4499.02	108.09
4456.70	3360.82	3269.83	3233.24	4275.30	3913.41	293.98	173.60	461.46	74.82	2246.15	-186.24	2088.28	116.33	4974.41	108.67
4440.09	3348.82	3258.28	3221.79	4258.23	3899.62	293.82	172.92	292.97	54.36	1631.57	-115.19	2080.07	116.30	4233.01	111.00
4403.39	3321.77	3232.12	3195.89	4221.63	3868.36	293.82	171.93	410.04	46.09	2053.53	-178.40	2085.48	116.23	4704.89	133.68
4451.57	3357.27	3266.45	3229.88	4269.67	3909.39	293.82	173.02	326.82	77.86	1755.38	-119.17	2080.92	116.33	4411.16	106.08
4426.51	3338.73	3248.50	3212.11	4244.85	3887.93	293.87	172.41	385.76	65.88	1967.25	-155.19	2083.85	116.27	4636.22	141.94
4497.67	3391.15	3299.20	3262.31	4315.84	3948.51	293.87	174.53	268.29	84.83	1547.67	-85.67	2079.03	116.42	4185.11	128.16
4468.00	3369.22	3277.97	3241.29	4286.40	3923.14	293.93	174.03	425.92	70.35	2118.33	-170.71	2087.04	116.36	4821.32	116.04
4456.70	3360.82	3269.83	3233.24	4275.30	3913.41	293.98	173.57	304.54	55.65	1675.62	-119.65	2081.15	116.33	4287.21	103.20
4449.82	3355.75	3264.92	3228.38	4268.43	3907.55	293.98	173.73	399.88	44.93	2022.20	-172.01	2086.50	116.32	4671.55	112.48
4482.32	3379.54	3287.89	3251.13	4301.20	3934.98	294.09	174.58	377.13	64.27	1942.62	-149.57	2085.29	116.39	4610.71	100.94
4411.17	3327.12	3237.20	3200.93	4230.22	3874.40	294.09	171.81	403.71	68.26	2030.57	-163.46	2084.14	116.24	4711.28	123.81
4428.98	3340.48	3250.17	3213.77	4247.48	3889.92	293.93	172.51	422.04	70.31	2099.46	-170.60	2085.58	116.28	4795.59	136.55
4399.52	3318.61	3228.99	3192.80	4218.44	3864.59	294.04	171.75	383.96	43.97	1958.09	-166.81	2084.07	116.22	4591.25	110.65
4417.87	3332.13	3242.07	3205.75	4236.74	3880.23	294.04	172.06	311.31	56.80	1695.42	-123.66	2080.14	116.25	4308.32	113.29
4427.05	3338.90	3248.61	3212.23	4245.89	3888.04	294.04	172.43	410.64	68.94	2057.72	-165.81	2084.99	116.27	4745.17	124.81
4424.93	3337.26	3247.01	3210.65	4243.95	3886.12	294.09	171.74	239.59	79.81	1434.39	-76.26	2075.32	116.27	4040.86	106.31
4413.10	3328.70	3238.76	3202.48	4231.82	3876.28	293.98	171.90	439.00	72.59	2159.16	-178.50	2085.83	116.24	4866.22	128.05
4429.34	3340.59	3250.24	3213.85	4248.17	3889.99	294.04	172.17	303.94	74.37	1669.41	-110.54	2079.16	116.28	4304.78	113.30
4434.29	3344.08	3253.58	3217.16	4253.45	3893.97	294.15	172.70	344.00	60.68	1816.27	-137.12	2082.18	116.29	4454.99	117.28
4402.53	3320.52	3230.76	3194.57	4222.11	3866.69	294.26	171.47	361.80	63.17	1877.05	-145.80	2081.92	116.22	4525.82	129.11
4423.00	3335.68	3245.44	3209.10	4242.35	3884.24	294.21	172.28	440.82	72.70	2166.89	-178.88	2086.22	116.26	4876.30	139.14
4462.02	3364.43	3273.24	3236.63	4281.27	3917.46	294.21	173.16	254.08	82.37	1491.56	-81.05	2077.19	116.34	4113.65	108.37
4441.36	3349.21	3258.52	3222.06	4260.66	3899.87	294.21	172.97	305.01	55.83	1675.34	-120.30	2080.63	116.30	4285.79	103.52
4402.35	3320.47	3230.72	3194.53	4221.76	3866.65	294.21	171.47	385.76	66.14	1964.15	-156.09	2083.02	116.22	4630.65	111.88
4384.00	3306.94	3217.64	3181.59	4203.48	3851.02	294.21	170.75	378.24	65.39	1934.58	-153.53	2082.06	116.18	4593.69	111.00
4402.35	3320.47	3230.72	3194.53	4221.76	3866.65	294.21	171.80	321.15	38.78	1729.91	-138.40	2081.12	116.22	4320.58	123.42
4446.13	3352.65	3261.83	3225.33	4265.59	3903.81	294.26	172.51	285.15	88.88	1602.44	-93.29	2077.91	116.31	4249.90	121.42
4448.42	3354.34	3263.46	3226.95	4267.88	3905.77	294.26	172.91	300.30	73.58	1658.43	-108.57	2079.63	116.32	4292.61	132.11
4498.77	3391.49	3299.41	3262.54	4317.96	3948.73	294.21	174.84	353.11	81.57	1856.56	-128.35	2083.62	116.42	4537.78	139.68
4512.56	3401.64	3309.23	3272.26	4331.72	3960.46	294.21	175.75	343.70	59.94	1824.77	-134.53	2084.79	116.45	4470.87	118.00
4535.73	3418.62	3325.62	3288.49	4355.03	3980.04	294.26	176.68	471.78	75.12	2293.19	-187.25	2091.29	116.50	5037.31	144.05
4530.94	3415.18	3322.31	3285.22	4350.09	3976.09	294.21	176.46	342.23	59.60	1821.66	-133.34	2085.34	116.49	4468.43	127.81
4570.41	3444.06	3350.20	3312.84	4389.86	4009.40	294.32	178.00	348.62	60.02	1849.69	-134.80	2086.95	116.57	4505.05	118.97
4512.74	3401.70	3309.26	3272.30	4332.07	3960.49	294.26	175.76	380.83	64.42	1959.75	-150.09	2086.46	116.45	4633.58	112.19
4485.53	3381.51	3289.70	3252.94	4305.25	3937.11	294.37	174.69	299.36	54.80	1660.16	-116.68	2081.86	116.39	4270.57	103.42
4462.56	3364.60	3273.35	3236.75	4282.32	3917.57	294.37	173.82	405.87	67.97	2044.60	-162.46	2085.91	116.35	4732.07	114.62
4436.77	3345.83	3255.25	3218.82	4256.08	3895.96	294.21	172.82	463.52	75.32	2251.12	-187.99	2087.71	116.29	4978.80	142.55
4463.41	3365.84	3274.70	3238.05	4281.82	3919.23	293.93	173.85	400.30	67.28	2024.63	-160.04	2085.73	116.35	4708.10	145.20
4492.90	3387.71	3295.89	3259.03	4310.90	3944.57	293.82	174.64	294.51	72.17	1643.02	-105.06	2080.94	116.41	4276.64	122.50
4492.72	3387.66	3295.86	3258.99	4310.55	3944.53	293.76	175.37	376.60	42.74	1942.88	-160.05	2086.83	116.41	4580.80	111.05
4513.02	3402.77	3310.51	3273.49	4330.48	3962.05	293.65	175.46	231.16	61.77	1415.30	-79.31	2078.94	116.45	3999.78	105.80
4483.17	3380.78	3289.25	3252.43	4300.68	3936.64	293.65	174.64	494.44	78.50	2369.42	-199.00	2090.66	116.39	5125.04	124.29
4423.49	3336.82	3246.73	3210.34	4241.17	3885.84	293.65	172.27	296.57	54.93	1642.67	-117.17	2079.69	116.27	4245.23	93.61
4383.98	3307.92	3218.83	3182.71	4201.29	3852.52	293.48	170.29	510.35	109.00	2414.28	-196.30	2086.70	116.19	5210.50	137.90
4406.90	3324.82	3235.18	3198.89	4224.13	3872.06	293.48	171.62	286.55	53.82	1604.25	-113.33	2078.68	116.23	4197.83	120.38
4420.30	3334.85	3244.92	3208.53	4237.15	3883.71	293.37	172.17	415.62	69.61	2075.28	-168.15	2085.05	116.26	4765.84	136.70
4431.95	3343.35	3253.13	3216.66	4248.93	3893.51	293.43	172.28	284.40	71.13	1598.90	-102.52	2078.45	116.29	4218.93	130.35
4459.66	3363.70	3272.79	3236.13	4276.73	3917.00	293.48	173.68	296.68	54.66	1647.57	-116.21	2080.94	116.34	4253.66	131.45
4521.66	3409.36	3316.95	3279.85	4338.59	3969.76	293.48	175.52	227.95	76.46	1404.22	-69.94	2078.27	116.47	4008.94	106.21
4500.62	3394.02	3302.15	3265.19	4317.25	3952.10	293.37	175.30	408.28	67.84	2058.43	-161.99	2087.37	116.43	4751.66	104.92
4459.30	3363.59	3272.72	3236.05	4276.03	3916.92	293.37	173.69	395.85	66.77	2008.17	-158.26	2085.44	116.34	4687.99	124.25
4351.72	3284.21	3195.91	3160.02	4169.00	3825.14	293.43	169.92	422.14	47.48	2091.36	-186.01	2084.41	116.12	4745.41	125.79
4207.58	3177.82	3092.98	3058.11	4025.67	3702.13	293.43	163.50	370.91	88.41	1885.82	-145.38	2074.71	115.82	4553.80	80.49
4061.52	3069.86	2988.48	2954.67	3880.76	3577.23	293.43	158.68	480.83	55.13	2269.29	-227.99	2078.07	115.52	4929.52	76.24
3961.15	2995.66	2916.65	2883.56	3781.24	3491.37	293.37	154.73	443.03	52.73	2119.41	-214.89	2072.93	115.31	4743.25	62.89
3862.93	2923.09	2846.42	2814.04	3683.70	3407.44	293.21	150.47	411.94	76.19	1993.42	-191.27	2066.76	115.11	4622.62	61.30
3785.60	2865.83	2790.95	2759.15	3607.24	3341.14	293.15	147.52	682.61	116.05	2968.80	-329.86	2078.54	114.94	5778.60	102.18
3701.90	2803.64	2730.68	2699.50	3524.89	3269.08	293.21	144.73	546.16	65.52	2462.92	-285.00	2070.64	114.77	5119.73	101.85
3640.63	2758.20	2686.67	2655.94	3464.43	3216.46	293.15	141.81	363.34	72.38	1789.14	-178.13	2057.04	114.64	4360.23	38.56
3538.91	2682.60	2613.38	2583.42	3364.45	3128.83	293.15	138.33	499.92	63.18	2274.50	-272.32	2063.16	114.43	4881.20	64.75

3521.14	2669.26	2600.41	2570.59	3347.27	3113.32	293.26	137.21	617.83	113.21	2700.55	-320.18	2067.52	114.39	5430.54	132.08
3541.17	2684.28	2615.01	2585.03	3366.67	3130.78	293.15	137.93	328.74	68.57	1650.88	-164.91	2051.92	114.43	4187.56	92.61
3534.40	2679.24	2610.12	2580.19	3360.01	3124.94	293.15	138.12	457.27	58.90	2118.66	-248.86	2060.51	114.42	4699.02	72.75
3487.00	2643.98	2575.94	2546.36	3313.48	3084.06	293.15	135.82	339.54	71.00	1683.47	-173.38	2050.78	114.32	4221.55	65.37
3455.13	2620.39	2553.09	2523.76	3281.95	3056.76	293.04	135.07	502.42	64.64	2273.31	-280.34	2060.85	114.25	4870.21	96.97
3419.07	2593.54	2527.06	2497.99	3246.59	3025.62	293.04	133.69	525.07	67.56	2351.33	-296.35	2061.17	114.18	4956.64	109.67
3439.49	2608.69	2541.73	2512.51	3266.75	3043.16	293.09	134.29	318.86	45.65	1602.93	-176.40	2049.31	114.22	4088.86	63.33
3405.55	2583.48	2517.29	2488.33	3233.35	3013.95	293.04	133.00	357.72	50.08	1740.22	-200.66	2050.59	114.15	4245.10	28.18
3342.37	2536.47	2471.71	2443.23	3171.34	2959.45	292.98	130.69	516.77	67.90	2311.65	-298.25	2058.47	114.02	4901.25	75.93
3317.62	2518.02	2453.82	2425.53	3147.12	2938.05	292.98	129.72	504.90	67.01	2265.33	-293.42	2057.02	113.97	4844.53	75.06
3299.49	2504.57	2440.78	2412.62	3129.26	2922.46	292.93	127.92	295.08	110.97	1497.20	-135.20	2039.73	113.93	4049.62	71.72
3315.23	2516.31	2452.17	2423.89	3144.66	2936.08	292.93	129.62	504.93	67.05	2265.16	-293.64	2056.96	113.96	4844.04	107.24
3295.00	2501.22	2437.53	2409.41	3124.87	2918.57	292.93	128.72	379.82	53.72	1807.01	-220.66	2048.53	113.92	4311.05	57.27
3290.50	2497.86	2434.28	2406.19	3120.47	2914.68	292.93	128.94	400.94	28.05	1884.11	-248.17	2051.25	113.91	4359.03	77.22
3254.41	2471.01	2408.24	2380.42	3085.06	2883.54	292.87	127.17	414.22	58.02	1927.26	-244.24	2049.47	113.83	4445.74	78.76
3243.04	2462.59	2400.08	2372.35	3073.83	2873.80	292.82	126.75	434.74	60.45	2000.61	-257.55	2050.44	113.81	4529.25	70.22
3209.49	2437.50	2375.72	2348.25	3041.19	2844.66	292.87	125.95	501.76	34.24	2241.43	-319.14	2055.63	113.74	4753.60	105.30
3191.54	2424.09	2362.72	2335.38	3023.66	2829.10	292.87	125.06	388.22	28.00	1825.47	-247.58	2047.44	113.70	4280.31	94.83
3225.21	2449.22	2387.10	2359.51	3056.53	2858.27	292.87	125.97	353.22	51.63	1701.45	-209.23	2044.70	113.77	4181.52	64.85
3245.02	2464.18	2401.66	2373.90	3075.51	2875.69	292.71	126.41	359.17	78.05	1724.98	-198.02	2044.28	113.81	4248.68	56.49
3247.40	2465.90	2403.31	2375.53	3077.96	2877.66	292.76	126.88	396.15	56.12	1860.62	-233.80	2048.12	113.82	4367.90	67.76
3218.21	2444.11	2382.17	2354.62	3049.45	2852.38	292.76	126.23	466.53	32.19	2114.17	-295.70	2053.51	113.76	4610.69	61.31
3191.28	2424.01	2362.67	2335.33	3023.15	2829.05	292.76	125.13	434.35	30.59	1993.57	-277.39	2050.57	113.70	4470.53	69.36
3186.79	2420.66	2359.42	2332.11	3018.77	2825.17	292.76	124.15	424.66	90.19	1956.17	-240.27	2046.51	113.69	4515.10	80.07
3227.06	2450.78	2388.65	2361.03	3057.96	2860.13	292.71	125.70	307.00	69.66	1532.81	-168.84	2040.55	113.78	4020.65	62.39
3177.68	2413.92	2352.89	2325.65	3009.76	2817.36	292.71	123.83	587.07	117.92	2546.39	-336.77	2056.28	113.67	5208.39	69.29
3117.15	2368.71	2309.01	2282.24	2950.72	2764.89	292.71	120.30	713.72	235.98	2997.74	-370.49	2057.50	113.54	5868.30	104.10
3148.40	2392.11	2331.74	2304.72	2981.07	2792.07	292.65	122.98	349.87	52.18	1679.76	-212.26	2042.13	113.61	4148.26	91.99
3168.71	2407.22	2346.39	2319.22	3001.01	2809.59	292.71	123.76	343.59	51.22	1659.40	-207.00	2042.34	113.65	4126.97	73.22
3166.34	2405.51	2344.74	2317.58	2998.57	2807.62	292.65	123.04	282.79	88.63	1436.51	-146.35	2035.90	113.65	3934.17	52.36
3159.61	2400.49	2339.86	2312.76	2992.00	2801.79	292.65	123.51	451.79	63.63	2052.43	-274.98	2049.12	113.63	4579.14	60.95
3152.88	2395.46	2334.99	2307.94	2985.44	2795.96	292.65	123.18	376.52	55.16	1777.38	-228.59	2044.01	113.62	4261.27	66.17
3152.88	2395.46	2334.99	2307.94	2985.44	2795.96	292.65	122.87	587.75	118.79	2545.81	-339.84	2055.66	113.62	5204.66	69.28
3099.10	2355.28	2295.99	2269.36	2933.01	2749.31	292.65	121.11	403.73	59.03	1869.82	-249.85	2044.19	113.51	4361.54	48.39
3054.19	2321.78	2263.48	2237.19	2889.14	2710.43	292.59	119.89	499.14	35.47	2212.70	-333.39	2051.23	113.41	4698.45	93.84
3063.14	2328.47	2269.97	2243.61	2897.86	2718.20	292.59	120.26	512.01	36.14	2260.69	-341.07	2052.37	113.43	4753.83	105.50
3054.06	2321.74	2263.45	2237.16	2888.90	2710.40	292.54	119.27	313.75	49.13	1536.43	-195.61	2036.82	113.41	3973.19	44.09
3020.75	2296.72	2239.14	2213.11	2856.72	2681.31	292.65	118.54	468.90	33.99	2098.30	-316.43	2048.18	113.34	4564.82	40.53
3027.46	2301.74	2244.01	2217.93	2863.25	2687.14	292.65	117.64	280.39	90.92	1410.42	-152.08	2031.26	113.36	3891.90	77.76
3043.12	2313.45	2255.38	2229.18	2878.49	2700.74	292.65	119.32	418.28	30.80	1916.59	-279.87	2045.21	113.39	4363.72	67.81
3034.30	2306.80	2248.91	2222.78	2870.02	2692.99	292.71	118.53	348.00	53.42	1658.69	-219.11	2038.52	113.37	4111.41	63.90
3056.30	2323.41	2265.08	2238.77	2891.08	2712.35	292.54	119.50	466.05	66.99	2091.54	-293.45	2047.14	113.42	4611.18	92.15
3063.14	2328.47	2269.97	2243.61	2897.86	2718.20	292.59	119.31	285.97	68.63	1435.77	-165.32	2034.00	113.43	3891.78	51.85
3038.65	2310.10	2252.13	2225.97	2874.13	2696.85	292.65	118.71	362.41	55.06	1711.73	-228.11	2039.63	113.38	4172.80	64.87
3002.86	2283.34	2226.15	2200.26	2839.31	2665.77	292.65	117.04	648.32	134.53	2747.83	-394.70	2055.67	113.30	5421.99	96.34
3011.68	2289.99	2232.62	2206.66	2847.77	2673.52	292.59	118.15	451.57	33.04	2034.03	-305.52	2046.70	113.32	4491.29	79.81
3034.05	2306.72	2248.86	2222.73	2869.54	2692.94	292.59	118.50	323.05	50.47	1567.78	-202.95	2036.83	113.37	4007.04	53.41
3007.20	2286.64	2229.37	2203.45	2843.42	2669.63	292.59	117.49	359.64	55.16	1697.75	-228.70	2038.50	113.31	4153.16	73.82
3061.03	2326.83	2268.37	2242.03	2895.92	2716.28	292.65	119.24	330.19	76.44	1596.53	-192.50	2036.75	113.43	4080.08	99.72
3101.08	2356.88	2297.57	2270.91	2934.70	2751.21	292.54	120.25	255.72	104.56	1329.35	-123.22	2031.03	113.51	3831.20	68.11
3116.89	2368.64	2308.96	2282.19	2950.23	2764.84	292.59	121.04	422.20	121.72	1937.79	-228.46	2042.63	113.54	4530.47	70.48
3130.21	2378.64	2318.69	2291.80	2963.08	2776.47	292.54	122.35	434.81	62.14	1986.92	-266.87	2047.16	113.57	4500.08	90.02
3177.29	2413.80	2352.81	2325.57	3009.00	2817.29	292.54	123.46	288.83	89.78	1459.92	-149.19	2036.62	113.67	3963.10	70.48
3150.51	2393.75	2333.34	2306.30	2983.00	2793.99	292.59	123.15	443.74	62.85	2021.96	-270.73	2048.33	113.62	4542.92	70.70
3153.01	2395.50	2335.01	2307.96	2985.69	2795.98	292.71	122.82	328.43	74.49	1601.58	-185.68	2039.51	113.62	4094.77	100.15
3191.14	2423.97	2362.64	2335.30	3022.90	2829.03	292.71	124.69	399.04	57.19	1864.15	-239.72	2046.62	113.70	4365.67	58.24
3139.69	2385.50	2325.29	2298.34	2972.82	2784.35	292.76	122.33	487.00	101.93	2177.30	-281.15	2049.00	113.59	4770.01	21.21
3155.13	2397.14	2336.61	2309.54	2987.63	2797.90	292.65	122.93	480.38	100.40	2155.16	-275.81	2049.04	113.62	4745.72	105.54
3152.88	2395.46	2334.99	2307.94	2985.44	2795.96	292.65	123.29	490.61	68.16	2192.97	-299.78	2051.46	113.62	4740.31	115.97
3186.53	2420.58	2359.37	2332.05	3018.26	2825.11	292.65	124.12	310.67	70.92	1541.13	-173.22	2039.48	113.69	4026.79	62.70
3197.61	2428.92	2367.47	2340.07	3028.96	2834.81	292.59	124.89	344.91	51.02	1667.83	-205.91	2043.33	113.71	4139.79	36.84
3168.71	2407.22	2346.39	2319.22	3001.01	2809.59	292.71	123.83	412.22	59.00	1909.39	-249.62	2046.81	113.65	4415.28	19.64
3061.03	2326.83	2268.37	2242.03	2895.92	2716.28	292.65	119.82	612.25	84.05	2624.72	-386.92	2057.08	113.43	5224.43	69.74
3036.53	2308.47	2250.53	2224.39	2872.20	2694.94	292.71	118.35	633.71	130.69	2698.77	-381.31	2055.55	113.37	5369.14	119.46
3029.82	2303.45	2245.66	2219.57	2865.66	2689.11	292.71	118.07	542.82	114.79	2366.94	-325.97	2049.52	113.36	4979.51	88.64
3025.22	2300.06	2242.39	2216.33	2861.07	2685.20	292.65	118.14	311.83	49.25	1525.80	-196.27	2035.79	113.35	3957.90	70.46
2991.68	2274.98	2218.03	2192.23	2828.43	2656.06	292.65	116.10	565.87	160.12	2445.21	-323.80	2047.84	113.28	5124.61	91.24
2987.20	2271.63	2214.78	2189.02	2824.08	2652.18	292.65	117.33	527.80	37.83	2308.79	-360.54	2051.50	113.27	4795.99	85.40
3018.51	2295.05	2237.51	2211.51	2854.54	2679.37	292.65	117.99	429.51	63.31	1953.68	-273.34	2043.59	113.34	4448.08	79.21
3040.76	2311.74	2253.73	2227.55	2876.07	2698.77	292.59	117.89	264.85	108.68	1355.01	-131.00	2029.56	113.38	3858.38	60.13

3016.03	2293.30	2235.84	2209.85	2851.88	2677.38	292.54	117.55	623.56	129.61	2659.33	-377.58	2054.39	113.33	5320.19	106.60
3058.79	2325.16	2266.75	2240.43	2893.74	2714.34	292.65	119.46	323.98	50.28	1574.24	-201.89	2037.65	113.42	4017.13	53.67
3078.94	2340.22	2281.37	2254.89	2913.37	2731.83	292.65	119.93	301.75	71.14	1495.18	-174.04	2035.50	113.46	3962.92	61.77
3096.98	2353.65	2294.39	2267.78	2931.07	2747.40	292.71	120.67	479.96	101.82	2146.39	-280.81	2047.35	113.50	4728.88	105.31
3101.72	2357.08	2297.69	2271.04	2935.93	2751.33	292.82	121.18	376.59	55.86	1771.23	-232.45	2042.46	113.51	4248.39	56.77
3096.98	2353.65	2294.39	2267.78	2931.07	2747.40	292.71	121.05	432.34	62.38	1973.77	-268.20	2046.03	113.50	4480.88	69.86
3141.80	2387.13	2326.89	2299.92	2974.76	2786.26	292.71	122.86	496.68	69.04	2213.71	-304.65	2051.55	113.60	4762.78	95.48
3144.04	2388.81	2328.51	2301.53	2976.95	2788.21	292.71	122.45	251.86	61.53	1321.67	-140.58	2034.45	113.60	3764.98	58.71
3085.91	2345.32	2286.29	2259.77	2920.40	2737.71	292.76	120.26	576.66	118.99	2497.11	-340.55	2053.17	113.48	5139.11	68.70
3041.01	2311.81	2253.78	2227.60	2876.55	2698.82	292.71	119.07	642.19	88.05	2731.27	-408.82	2058.60	113.38	5343.73	59.53
2996.27	2278.36	2221.30	2195.47	2833.02	2659.97	292.71	117.54	445.20	32.79	2008.87	-302.72	2045.81	113.29	4460.79	79.52
3045.49	2315.16	2257.03	2230.81	2880.91	2702.71	292.71	118.63	333.76	77.36	1607.57	-195.71	2036.50	113.39	4091.50	82.06
3016.52	2293.45	2235.94	2209.95	2852.84	2677.48	292.76	117.53	468.21	101.90	2093.57	-281.12	2044.32	113.33	4657.74	83.04
3059.42	2325.36	2266.87	2240.56	2894.96	2714.46	292.93	119.58	425.21	62.15	1943.04	-266.95	2044.46	113.42	4440.91	79.18
3077.21	2338.70	2279.84	2253.39	2912.16	2729.98	292.87	119.87	334.30	76.87	1613.43	-193.98	2037.51	113.46	4101.45	73.14
3072.47	2335.28	2276.54	2250.12	2907.31	2726.05	292.76	120.20	542.66	75.66	2372.57	-340.96	2052.70	113.45	4936.28	99.03
3137.19	2383.74	2323.61	2296.68	2970.14	2782.35	292.65	122.54	351.88	52.55	1685.68	-214.29	2041.92	113.59	4153.86	64.82
3119.39	2370.39	2310.64	2283.85	2952.91	2766.83	292.71	121.20	303.87	94.42	1507.38	-160.73	2035.63	113.55	4015.33	71.62
3092.50	2350.30	2291.14	2264.56	2926.70	2743.51	292.71	120.51	542.91	112.90	2375.04	-319.36	2051.21	113.49	4996.70	55.70
3074.84	2336.99	2278.19	2251.76	2909.74	2728.01	292.82	120.20	441.25	63.78	2003.43	-275.85	2045.98	113.45	4512.24	40.25
3012.05	2290.11	2232.69	2206.74	2848.49	2673.59	292.76	117.73	418.62	62.13	1913.17	-266.84	2042.66	113.32	4400.79	88.32
3030.20	2303.57	2245.73	2219.65	2866.39	2689.18	292.87	118.11	663.04	136.13	2804.73	-400.27	2057.28	113.36	5492.39	73.49
3047.85	2316.87	2258.68	2232.45	2883.33	2704.67	292.76	119.02	308.98	48.64	1518.21	-192.96	2036.30	113.40	3951.59	44.07
3043.37	2313.53	2255.43	2229.23	2878.97	2700.79	292.76	118.93	399.25	59.34	1846.51	-251.57	2042.25	113.39	4328.10	96.54
3090.26	2348.63	2289.52	2262.95	2924.52	2741.57	292.71	120.73	363.91	54.54	1723.63	-225.23	2041.28	113.49	4192.34	74.81
3074.59	2336.91	2278.14	2251.70	2909.25	2727.97	292.71	119.77	365.87	82.44	1728.15	-213.37	2039.45	113.45	4235.77	47.25
3072.35	2335.24	2276.52	2250.10	2907.07	2726.02	292.71	120.09	426.57	62.10	1949.68	-266.67	2044.93	113.45	4450.16	69.50
3065.63	2330.22	2271.65	2245.28	2900.53	2720.19	292.71	120.43	556.51	38.72	2423.15	-370.71	2055.56	113.44	4937.10	88.12
3076.95	2338.63	2279.79	2253.34	2911.68	2729.93	292.76	120.32	487.14	69.10	2170.88	-304.98	2049.11	113.46	4705.03	83.99
3079.07	2340.26	2281.39	2254.92	2913.61	2731.85	292.71	120.27	341.87	52.12	1641.93	-211.98	2039.47	113.46	4097.14	73.14
3063.27	2328.51	2270.00	2243.64	2898.10	2718.23	292.65	119.69	379.58	56.74	1777.36	-237.29	2041.52	113.43	4251.04	66.41
3052.20	2320.18	2261.90	2235.63	2887.45	2708.54	292.71	119.30	423.97	62.12	1937.69	-266.76	2044.18	113.41	4433.90	79.17
3061.15	2326.87	2268.40	2242.06	2896.17	2716.31	292.71	119.25	384.39	85.97	1793.90	-225.66	2040.22	113.43	4311.49	86.61
3016.52	2293.45	2235.94	2209.95	2852.84	2677.48	292.76	117.56	594.55	124.43	2553.67	-359.55	2052.51	113.33	5196.51	92.80
3050.09	2318.55	2260.30	2234.05	2885.51	2706.62	292.76	119.13	335.19	51.70	1613.97	-209.71	2038.13	113.40	4061.81	63.47
3029.82	2303.45	2245.66	2219.57	2865.66	2689.11	292.71	118.49	492.99	70.65	2186.34	-313.52	2048.21	113.36	4716.53	42.12
2998.51	2280.03	2222.92	2197.07	2835.20	2661.91	292.71	117.29	507.98	73.04	2237.07	-326.62	2048.39	113.29	4770.44	63.91
2971.80	2260.00	2203.46	2177.82	2809.34	2638.63	292.76	116.12	368.41	56.72	1725.22	-237.26	2038.04	113.24	4180.49	93.34
3085.78	2345.28	2286.27	2259.74	2920.16	2737.68	292.71	119.91	271.20	87.57	1384.24	-143.73	2032.59	113.48	3865.25	69.05
3061.28	2326.91	2268.42	2242.09	2896.41	2716.33	292.76	119.68	456.93	65.84	2058.85	-287.14	2046.65	113.43	4574.24	61.29
3029.95	2303.49	2245.68	2219.59	2865.90	2689.13	292.76	118.36	349.57	53.66	1663.85	-220.45	2038.49	113.36	4116.85	82.75
3079.19	2340.30	2281.42	2254.95	2913.86	2731.88	292.76	117.56	738.21	343.58	3079.69	-337.64	2052.61	113.46	6107.48	109.13
3068.00	2331.93	2273.30	2246.91	2902.95	2722.16	292.76	119.86	362.01	54.62	1713.92	-225.67	2040.48	113.44	4178.65	84.01
3059.04	2325.24	2266.80	2240.48	2894.23	2714.39	292.76	119.94	416.08	30.55	1910.52	-276.96	2045.50	113.42	4359.05	87.64
3090.77	2348.79	2289.61	2263.06	2925.50	2741.67	292.93	120.79	408.91	59.76	1887.55	-253.86	2044.28	113.49	4380.92	39.15
3079.45	2340.38	2281.47	2255.00	2914.35	2731.93	292.87	119.96	353.59	80.20	1683.97	-205.57	2038.80	113.46	4184.41	65.44
3083.80	2343.69	2284.69	2258.19	2918.47	2735.79	292.82	120.50	394.70	58.21	1834.96	-245.36	2043.13	113.47	4319.62	96.52
3063.77	2328.66	2270.10	2243.75	2899.08	2718.32	292.87	119.80	474.08	67.81	2121.63	-297.93	2047.87	113.43	4646.68	83.07
3068.12	2331.97	2273.32	2246.94	2903.20	2722.19	292.82	120.04	554.70	77.16	2415.86	-349.17	2053.39	113.44	4985.43	89.13
3128.74	2377.21	2317.21	2290.36	2962.39	2774.68	292.87	121.59	258.20	83.75	1342.24	-134.24	2033.20	113.57	3818.30	76.80
3137.45	2383.82	2323.66	2296.74	2970.64	2782.40	292.76	122.59	395.53	57.54	1844.69	-241.65	2044.78	113.59	4337.07	67.86
3112.92	2365.45	2305.81	2279.08	2946.85	2761.05	292.82	121.75	516.36	71.83	2281.77	-319.93	2052.04	113.54	4837.36	54.06
3090.52	2348.71	2289.57	2263.01	2925.01	2741.62	292.82	120.40	415.85	90.83	1912.08	-242.55	2043.09	113.49	4453.19	69.68
3108.57	2362.14	2302.59	2275.89	2942.73	2757.19	292.87	121.58	510.65	71.25	2260.42	-316.77	2051.54	113.53	4812.19	86.06
3142.06	2387.21	2326.94	2299.98	2975.26	2786.32	292.82	122.71	322.50	49.13	1579.22	-195.57	2040.13	113.60	4031.71	54.08
3099.61	2355.44	2296.09	2269.46	2933.99	2749.41	292.87	121.18	463.71	65.98	2088.30	-287.90	2048.18	113.51	4612.96	92.82
3128.48	2377.13	2317.16	2290.31	2961.89	2774.63	292.76	122.27	424.28	60.97	1948.27	-260.43	2046.41	113.57	4455.34	89.66
3151.16	2393.95	2333.46	2306.44	2984.26	2794.12	292.87	122.76	396.12	86.10	1847.77	-226.07	2043.66	113.62	4383.96	78.43
3191.67	2424.14	2362.74	2335.41	3023.91	2829.13	292.93	124.80	489.86	67.42	2194.98	-295.72	2052.49	113.70	4747.53	95.55
3166.99	2405.71	2344.86	2317.72	2999.82	2807.75	292.93	123.84	500.74	69.07	2231.52	-304.78	2052.50	113.65	4786.55	53.52
3126.75	2375.61	2315.64	2288.81	2960.70	2772.79	292.98	122.15	364.27	54.11	1729.42	-222.84	2042.39	113.56	4203.06	37.60
3088.40	2347.07	2287.97	2261.43	2923.08	2739.70	292.87	120.93	656.21	88.55	2788.14	-411.54	2060.69	113.48	5416.46	96.92
3099.48	2355.40	2296.06	2269.44	2933.74	2749.39	292.82	121.08	361.63	54.15	1716.44	-223.12	2041.40	113.51	4185.10	84.25
3126.63	2375.57	2315.61	2288.78	2960.45	2772.76	292.93	121.50	282.22	89.30	1429.39	-148.02	2034.56	113.56	3922.50	43.87
3045.99	2315.32	2257.12	2230.92	2881.88	2702.81	292.93	118.70	558.17	117.01	2424.75	-333.70	2050.92	113.39	5049.25	56.48
3016.65	2293.49	2235.96	2209.98	2853.08	2677.50	292.82	117.56	576.54	121.22	2488.06	-348.36	2051.35	113.33	5119.69	114.54
3016.65	2293.49	2235.96	2209.98	2853.08	2677.50	292.82	117.88	387.79	58.39	1801.41	-246.35	2040.69	113.33	4273.14	86.05
2980.99	2266.77	2210.00	2184.30	2818.51	2646.44	292.87	116.64	540.53	77.31	2353.40	-350.02	2050.15	113.26	4901.25	76.77
2983.10	2268.40	2211.60	2185.88	2820.45	2648.36	292.82	117.04	454.43	33.46	2040.82	-310.43	2046.10	113.26	4494.71	80.47
3003.23	2283.45	2226.22	2200.34	2840.02	2665.85	292.82	117.44	473.32	68.80	2111.33	-303.43	2046.14	113.30	4626.91	82.84

3034.55	2306.87	2248.95	2222.83	2870.50	2693.04	292.82	118.20	301.95	71.93	1490.33	-176.81	2034.10	113.37	3953.07	79.63
3063.64	2328.62	2270.07	2243.72	2898.83	2718.30	292.82	119.39	590.68	122.17	2545.40	-351.63	2053.48	113.43	5192.93	92.98
3106.20	2360.42	2300.94	2274.26	2940.29	2755.22	292.82	121.00	329.26	75.46	1598.75	-189.07	2038.09	113.52	4087.01	45.74
3104.09	2358.79	2299.34	2272.68	2938.36	2753.30	292.87	121.36	463.35	65.86	2087.56	-287.26	2048.28	113.52	4612.67	61.95
3117.53	2368.83	2309.09	2282.32	2951.46	2764.96	292.87	121.94	526.52	72.91	2319.32	-325.87	2052.83	113.54	4881.20	109.27
3164.49	2403.96	2343.19	2316.06	2997.13	2805.75	292.82	123.65	399.40	57.60	1862.12	-241.99	2045.84	113.64	4360.27	78.09
3130.98	2378.88	2318.84	2291.97	2964.58	2776.62	292.87	121.97	370.91	82.19	1753.46	-212.47	2041.47	113.57	4271.10	57.38
3104.09	2358.79	2299.34	2272.68	2938.36	2753.30	292.87	121.42	532.46	73.86	2339.30	-331.05	2052.86	113.52	4902.37	87.82
3117.53	2368.83	2309.09	2282.32	2951.46	2764.96	292.87	121.99	581.39	79.24	2519.20	-360.50	2056.46	113.54	5111.32	80.12
3175.96	2412.41	2351.36	2324.15	3008.58	2815.52	292.93	123.18	240.46	98.57	1283.08	-111.92	2032.64	113.67	3779.68	76.18
3155.64	2397.30	2336.71	2309.65	2988.63	2798.00	292.87	121.57	526.08	216.17	2318.78	-246.82	2046.01	113.62	5095.41	102.70
3140.33	2385.70	2325.41	2298.48	2974.07	2784.47	293.04	122.33	333.19	75.54	1617.23	-189.32	2039.39	113.59	4111.94	36.84
3115.29	2367.16	2307.46	2280.72	2949.28	2763.02	292.87	122.19	451.03	32.14	2044.87	-295.13	2049.53	113.54	4518.17	50.60
3104.09	2358.79	2299.34	2272.68	2938.36	2753.30	292.87	120.92	381.36	84.54	1788.17	-220.66	2041.31	113.52	4309.16	96.52
3128.87	2377.25	2317.24	2290.39	2962.64	2774.70	292.93	122.28	418.24	60.27	1926.30	-256.62	2046.01	113.57	4430.05	89.31
3104.21	2358.83	2299.36	2272.71	2938.60	2753.33	292.93	121.30	398.71	58.38	1852.06	-246.29	2044.00	113.52	4341.68	68.09
3128.74	2377.21	2317.21	2290.36	2962.39	2774.68	292.87	122.39	534.70	73.64	2350.50	-329.85	2053.68	113.57	4918.62	88.16
3137.71	2383.90	2323.71	2296.79	2971.13	2782.45	292.87	122.63	418.56	60.18	1928.56	-256.09	2046.30	113.59	4433.72	69.54
3101.85	2357.12	2297.71	2271.07	2936.17	2751.36	292.87	120.84	377.90	83.98	1775.28	-218.73	2041.03	113.51	4293.80	57.73
3066.01	2330.34	2271.72	2245.36	2901.26	2720.27	292.87	119.92	510.89	72.08	2255.99	-321.32	2050.40	113.44	4801.39	96.83
3113.05	2365.49	2305.84	2279.11	2947.09	2761.07	292.87	121.68	435.74	62.53	1988.07	-268.98	2046.71	113.54	4499.28	110.91
3153.79	2395.74	2335.16	2308.13	2987.19	2796.14	293.04	122.84	270.18	64.54	1389.48	-151.04	2035.89	113.62	3845.50	68.95
3133.48	2380.63	2320.51	2293.63	2967.26	2778.62	292.98	122.58	543.67	74.58	2383.72	-335.00	2054.39	113.58	4957.51	55.56
3115.42	2367.20	2307.49	2280.74	2949.53	2763.04	292.93	121.75	405.23	58.97	1877.22	-249.52	2044.76	113.54	4371.96	68.60
3084.18	2343.80	2284.77	2258.27	2919.20	2735.86	292.98	120.50	370.76	55.42	1747.74	-230.08	2041.54	113.47	4219.36	75.66
3124.51	2373.94	2314.01	2287.20	2958.51	2770.84	292.98	121.72	391.39	85.85	1827.20	-225.21	2042.56	113.56	4357.07	78.14
3156.16	2397.46	2336.81	2309.77	2989.63	2798.10	293.09	122.61	350.82	104.32	1682.70	-185.28	2039.57	113.63	4228.37	85.31
3125.28	2374.18	2314.16	2287.37	2960.00	2770.99	293.32	122.13	408.48	59.21	1890.15	-250.81	2045.24	113.56	4387.96	68.86
3123.04	2372.50	2312.54	2285.76	2957.82	2769.05	293.32	120.51	730.88	240.58	3060.63	-379.15	2058.59	113.55	5945.60	79.98
3123.17	2372.54	2312.56	2285.79	2958.06	2769.08	293.37	122.06	421.43	60.73	1937.04	-259.15	2046.03	113.55	4441.70	69.71
3181.76	2416.17	2354.87	2327.65	3015.48	2819.67	293.48	123.37	272.19	107.42	1399.08	-128.56	2034.56	113.68	3921.74	87.94
3179.51	2414.49	2353.24	2326.04	3013.29	2817.72	293.48	123.85	345.02	76.87	1665.07	-193.94	2041.33	113.67	4171.88	28.06

SUMS					
-796.79	**38020.2**	**126399.0**	**-792.5**	**54.8**	**-24.3**

Chemical Loss 1	Sensible and Latent Loss	Total Output	Chem Loss 2	Grams Produced	
				CO	HC
0	0.00	0	0	0.00	0.00
-2	230.99	796	-2	0.23	-0.08
1	174.10	636	1	0.28	-0.04
-1	192.56	662	-1	0.26	-0.06
0	142.82	498	0	0.19	-0.04
-2	170.74	557	-2	0.18	-0.07
-1	171.53	598	-1	0.17	-0.06
-1	138.72	460	-1	0.15	-0.05
-1	146.43	495	-1	0.15	-0.05
-2	179.36	633	-2	0.18	-0.06
0	174.76	679	0	0.21	-0.04
3	179.32	715	3	0.37	-0.02
-1	188.36	666	-1	0.25	-0.06
-1	158.28	569	-1	0.15	-0.05
1	122.13	475	1	0.18	-0.02
-1	153.07	488	-1	0.22	-0.06
-1	187.99	667	-1	0.18	-0.06
-1	150.62	534	-1	0.15	-0.05
-1	137.90	460	-1	0.19	-0.05
-2	195.94	660	-2	0.20	-0.07
1	183.80	669	1	0.30	-0.05
-1	140.02	459	-1	0.15	-0.05
-1	135.27	463	-1	0.18	-0.04
-1	135.31	464	-1	0.14	-0.05
-1	192.05	662	-1	0.26	-0.06
-2	189.23	666	-2	0.19	-0.06
-1	134.29	465	-1	0.14	-0.05
-2	174.67	595	-2	0.18	-0.06
-1	189.21	665	-1	0.25	-0.06
1	167.97	642	1	0.26	-0.03
0	151.96	532	0	0.20	-0.05
0	159.25	567	0	0.21	-0.05
0	144.90	538	0	0.18	-0.04
-1	174.48	638	-1	0.17	-0.05
-2	210.52	730	-2	0.21	-0.07
0	137.94	503	0	0.18	-0.04
1	155.66	611	1	0.28	-0.02
2	173.91	678	2	0.31	-0.03
0	158.93	566	0	0.26	-0.04
-1	161.67	565	-1	0.16	-0.05
-1	181.35	630	-1	0.24	-0.05
-1	171.15	598	-1	0.23	-0.05
-1	144.37	497	-1	0.14	-0.05
0	16.91	59	0	0.02	-0.01
-0.07	41.14	151	0	0.05	-0.01
-0.76	172.10	578	-1	0.24	-0.06
-0.67	152.46	515	-1	0.21	-0.05
-0.93	141.42	443	-1	0.21	-0.05
-0.60	158.95	551	-1	0.22	-0.05

-1.57	201.12	719	-2	0.20	-0.06
-1.38	158.21	553	-2	0.16	-0.05
-1.38	134.96	452	-1	0.14	-0.05
-1.20	146.87	523	-1	0.15	-0.05
-1.64	170.41	584	-2	0.18	-0.06
-0.43	172.09	624	0	0.23	-0.05
-1.23	178.86	660	-1	0.17	-0.05
-1.36	165.78	590	-2	0.17	-0.05
1.23	138.71	531	1	0.26	-0.02
0.52	140.56	530	1	0.22	-0.03
-0.70	153.30	519	-1	0.21	-0.05
-1.01	120.60	426	-1	0.12	-0.04
1.31	93.43	367	1	0.20	-0.01
-1.62	105.07	317	-2	0.13	-0.05
-1.76	120.98	385	-1	0.14	-0.06
-0.83	133.01	457	-1	0.20	-0.05
0.10	118.26	429	0	0.22	-0.04
-0.90	116.67	389	-1	0.18	-0.05
-1.56	92.77	288	-2	0.12	-0.05
-3.19	120.06	346	-2	0.11	-0.08
-1.05	125.63	423	-1	0.21	-0.06
-2.83	134.41	374	-3	0.19	-0.08
-3.04	123.77	385	-3	0.11	-0.07
0.08	97.66	366	0	0.18	-0.03
-2.09	120.71	388	-2	0.16	-0.07
-1.11	125.43	424	-1	0.21	-0.06
-1.75	122.75	428	-2	0.15	-0.06
-0.74	110.12	397	-1	0.17	-0.04
-2.20	122.61	387	-2	0.16	-0.07
-2.28	123.82	386	-3	0.17	-0.07
-1.63	119.32	347	-1	0.22	-0.07
-0.63	107.54	401	-1	0.17	-0.04
-1.19	126.23	425	-1	0.21	-0.06
-1.63	120.85	431	-2	0.15	-0.06
-1.79	115.73	394	-2	0.15	-0.06
-1.68	106.59	361	-2	0.14	-0.05
-1.62	112.93	397	-1	0.14	-0.05
-0.10	119.84	431	0	0.24	-0.05
-0.34	117.25	392	0	0.25	-0.05
-1.99	119.21	392	-2	0.15	-0.06
-2.83	139.37	415	-3	0.19	-0.09
-1.30	137.17	458	-1	0.23	-0.07
-2.05	127.65	426	-2	0.16	-0.07
-0.72	109.41	401	-1	0.17	-0.04
-1.92	125.51	429	-2	0.16	-0.06
-0.82	111.89	399	-1	0.18	-0.05
-0.77	94.81	331	-1	0.16	-0.04
-2.85	131.40	382	-2	0.19	-0.09
-3.07	129.04	427	-3	0.11	-0.08
-2.24	129.72	426	-2	0.17	-0.07
-3.25	132.10	424	-3	0.12	-0.08
-1.33	116.39	438	-1	0.13	-0.05
-2.08	153.45	445	-2	0.29	-0.09
-0.72	118.53	436	-1	0.18	-0.05
-1.54	105.78	364	-2	0.13	-0.05
-2.67	130.28	384	-2	0.18	-0.08
-2.29	124.13	390	-3	0.17	-0.07
-3.12	123.29	392	-3	0.11	-0.08
0.67	118.85	435	1	0.28	-0.04
-2.45	134.25	423	-2	0.18	-0.08
-1.87	117.34	397	-2	0.15	-0.06
-1.70	107.53	364	-2	0.14	-0.06
0.58	111.58	400	1	0.27	-0.04
-2.53	127.14	388	-3	0.18	-0.08
-0.84	112.31	401	-1	0.18	-0.05
-2.33	116.99	356	-3	0.16	-0.07
-0.21	95.55	332	0	0.20	-0.04
-3.16	109.96	321	-3	0.10	-0.08
-3.26	124.49	392	-3	0.11	-0.08
-1.13	116.97	398	-1	0.20	-0.06

-2.30	108.02	322	-2	0.15	-0.07
-2.32	122.73	393	-2	0.17	-0.07
-3.73	151.48	409	-4	0.23	-0.11
-1.84	108.18	365	-2	0.14	-0.06
-2.62	119.39	354	-2	0.17	-0.08
-2.15	105.16	325	-3	0.15	-0.07
-2.48	124.21	393	-2	0.17	-0.08
-1.16	149.01	538	-1	0.25	-0.07
-0.80	127.13	474	-1	0.20	-0.05
-1.88	109.97	364	-2	0.14	-0.06
-2.43	111.11	320	-2	0.16	-0.07
-1.60	112.60	404	-1	0.14	-0.05
-3.75	137.43	424	-4	0.13	-0.09
-1.00	107.08	366	-1	0.18	-0.05
-2.73	144.68	459	-2	0.20	-0.08
-0.04	128.20	473	0	0.25	-0.05
-2.42	118.45	357	-2	0.17	-0.07
-1.54	104.75	370	-2	0.13	-0.05
-3.05	115.54	360	-3	0.11	-0.07
-1.87	102.81	329	-2	0.14	-0.06
-2.50	126.31	392	-2	0.18	-0.08
-2.86	139.40	423	-4	0.20	-0.09
-2.95	113.60	363	-3	0.10	-0.07
-1.76	115.05	403	-2	0.15	-0.06
-2.55	127.36	392	-3	0.18	-0.08
0.08	106.23	410	0	0.21	-0.04
-2.79	130.84	389	-3	0.19	-0.08
-0.96	114.26	404	-1	0.19	-0.05
-2.01	119.30	400	-2	0.16	-0.06
-2.36	131.47	431	-2	0.18	-0.07
-3.03	142.17	421	-3	0.20	-0.09
0.02	108.35	409	0	0.21	-0.04
-1.56	105.08	371	-2	0.13	-0.05
-2.17	114.05	363	-2	0.16	-0.07
-2.13	113.13	364	-2	0.15	-0.07
-2.84	126.26	438	-2	0.11	-0.07
-0.14	121.56	440	0	0.25	-0.05
-1.09	133.20	472	-1	0.22	-0.06
-1.45	141.13	465	-2	0.25	-0.07
-1.97	119.97	400	-2	0.15	-0.06
-3.21	147.26	418	-3	0.21	-0.10
-2.11	129.93	434	-2	0.17	-0.07
-1.98	120.95	400	-2	0.15	-0.06
-2.07	114.27	363	-2	0.15	-0.07
-1.50	104.92	372	-2	0.13	-0.05
-2.29	116.91	361	-2	0.16	-0.07
-3.22	145.78	420	-3	0.21	-0.10
-2.86	148.07	460	-3	0.20	-0.09
-0.95	123.45	440	-1	0.20	-0.05
-2.84	113.89	365	-3	0.10	-0.07
-0.47	106.28	414	0	0.16	-0.04
-2.92	127.21	352	-4	0.19	-0.09
-1.37	94.99	339	-1	0.12	-0.05
-2.32	140.22	382	-2	0.28	-0.09
-1.71	122.09	443	-2	0.15	-0.06
-2.83	139.52	427	-3	0.20	-0.09
-0.98	131.33	476	-1	0.21	-0.06
-1.90	133.35	475	-2	0.17	-0.06
0.16	106.05	414	0	0.20	-0.03
-2.08	107.00	329	-2	0.15	-0.06
-2.43	126.67	396	-2	0.17	-0.08
-3.66	129.45	395	-5	0.12	-0.09
-1.01	81.50	267	-1	0.15	-0.05
-2.67	78.91	228	-3	0.08	-0.06
-2.15	65.03	198	-2	0.07	-0.05
-1.53	62.82	199	-2	0.10	-0.05
-3.78	105.95	245	-3	0.20	-0.10
-4.36	106.21	289	-5	0.13	-0.10
-0.93	39.49	135	-2	0.06	-0.03
-2.77	67.52	196	0	0.08	-0.06

-5.03	137.11	346	-5	0.27	-0.14
-2.13	94.74	342	-2	0.15	-0.07
-2.93	75.69	231	-4	0.09	-0.07
-1.59	66.95	239	-1	0.11	-0.05
-4.29	101.25	294	-5	0.13	-0.10
-5.05	114.72	325	-4	0.15	-0.12
-2.02	65.36	241	-3	0.07	-0.05
-1.00	29.18	102	-1	0.03	-0.02
-3.56	79.49	228	-2	0.10	-0.08
-3.50	78.56	229	-5	0.10	-0.08
-0.44	72.15	276	0	0.19	-0.04
-5.01	112.25	328	-6	0.15	-0.12
-2.21	59.48	204	-3	0.07	-0.05
-3.89	81.11	271	-2	0.05	-0.08
-3.29	82.06	269	-5	0.10	-0.08
-3.05	73.27	234	-2	0.09	-0.07
-6.29	111.59	330	-6	0.07	-0.13
-4.85	99.68	340	-5	0.06	-0.10
-2.44	67.29	240	-3	0.08	-0.06
-1.59	58.08	205	-1	0.10	-0.05
-2.75	70.51	237	-3	0.09	-0.06
-3.49	64.81	200	-3	0.04	-0.07
-3.82	73.18	235	-3	0.05	-0.08
-2.66	82.73	268	-3	0.16	-0.08
-1.54	63.93	242	-2	0.11	-0.05
-2.91	72.20	192	-3	0.15	-0.08
-2.40	106.50	244	-2	0.41	-0.12
-3.54	95.54	344	-4	0.11	-0.08
-2.76	75.98	275	-3	0.09	-0.07
-0.77	53.13	209	-1	0.12	-0.03
-2.81	63.75	200	-3	0.08	-0.07
-2.69	68.86	239	-2	0.08	-0.06
-2.94	72.22	192	-4	0.16	-0.08
-2.11	50.50	169	-2	0.06	-0.05
-5.93	99.77	298	-4	0.07	-0.12
-6.75	112.25	330	-8	0.08	-0.14
-1.62	45.71	174	-3	0.05	-0.04
-2.50	43.03	134	-1	0.03	-0.05
-1.23	78.98	315	-1	0.18	-0.05
-3.86	71.67	237	-7	0.05	-0.08
-2.57	66.47	241	-1	0.08	-0.06
-4.52	96.67	300	-6	0.13	-0.11
-1.29	53.14	210	-1	0.09	-0.04
-2.69	67.56	240	-2	0.08	-0.06
-4.62	100.96	253	-5	0.23	-0.13
-4.83	84.64	269	-5	0.06	-0.10
-2.03	55.44	208	-3	0.07	-0.05
-3.08	76.90	275	-2	0.10	-0.07
-2.84	102.56	380	-3	0.18	-0.08
-0.34	68.45	281	0	0.18	-0.04
-1.66	72.15	235	-1	0.19	-0.06
-4.09	94.11	303	-4	0.12	-0.10
-1.06	71.54	279	-1	0.16	-0.05
-3.23	73.92	235	-3	0.10	-0.08
-2.72	102.87	380	-2	0.18	-0.08
-2.43	60.67	204	-6	0.07	-0.06
-0.80	22.01	66	1	0.04	-0.02
-3.90	109.44	331	-2	0.22	-0.11
-5.66	121.63	364	-7	0.16	-0.13
-1.59	64.29	243	-2	0.11	-0.05
-1.38	38.21	138	-2	0.04	-0.03
-0.85	20.49	68	-1	0.03	-0.02
-4.04	73.77	192	-1	0.11	-0.09
-5.57	125.03	317	-6	0.29	-0.15
-3.76	92.40	261	-5	0.20	-0.10
-2.61	73.08	279	-2	0.09	-0.06
-2.92	94.16	258	-4	0.28	-0.10
-5.73	91.13	264	-4	0.07	-0.12
-3.73	82.94	271	-5	0.11	-0.09
-0.35	60.48	246	0	0.17	-0.04

-4.96	111.57	287	-4	0.25	-0.14
-2.02	55.69	209	-3	0.07	-0.05
-1.60	63.38	244	0	0.11	-0.05
-3.98	109.29	332	-5	0.22	-0.11
-2.36	59.13	206	-3	0.07	-0.06
-3.20	73.07	236	-2	0.10	-0.07
-4.71	100.20	298	-5	0.14	-0.11
-1.23	59.94	248	-1	0.09	-0.04
-2.96	71.66	194	-3	0.16	-0.08
-3.57	63.10	159	-4	0.10	-0.08
-4.80	84.32	271	-2	0.06	-0.10
-2.37	84.43	312	-3	0.15	-0.07
-3.19	86.24	267	-2	0.18	-0.09
-3.64	82.83	271	-5	0.11	-0.09
-2.09	75.23	277	-2	0.13	-0.06
-5.31	104.35	295	-6	0.15	-0.12
-2.52	67.34	242	-3	0.08	-0.06
-1.19	72.81	279	-1	0.17	-0.05
-2.30	58.00	163	-5	0.12	-0.06
-1.89	42.13	135	0	0.06	-0.04
-4.10	92.42	306	-4	0.12	-0.10
-3.53	77.02	189	-6	0.18	-0.10
-1.61	45.67	175	-1	0.05	-0.04
-4.28	100.82	342	-3	0.13	-0.10
-3.04	77.85	276	-5	0.10	-0.07
-1.46	48.71	172	-1	0.09	-0.04
-3.19	72.69	237	-3	0.10	-0.07
-5.91	94.03	262	-6	0.07	-0.12
-4.20	88.19	267	-4	0.12	-0.10
-2.85	75.99	277	-3	0.09	-0.07
-2.82	69.22	240	-3	0.09	-0.07
-3.65	82.81	271	-3	0.11	-0.09
-2.81	89.42	308	-3	0.17	-0.08
-4.20	96.99	258	-4	0.22	-0.12
-2.46	65.94	243	-3	0.08	-0.06
-2.16	44.28	133	-3	0.06	-0.05
-3.39	67.30	199	-1	0.10	-0.08
-4.02	97.37	345	-4	0.12	-0.09
-1.01	70.06	282	-1	0.15	-0.05
-2.96	64.25	202	-3	0.09	-0.07
-3.35	86.10	312	-2	0.11	-0.08
0.08	109.05	242	0	0.60	-0.11
-3.43	87.44	311	-2	0.11	-0.08
-4.94	92.58	307	-8	0.06	-0.10
-1.73	40.88	136	-2	0.05	-0.04
-1.96	67.40	242	-1	0.12	-0.06
-4.17	100.69	342	-4	0.13	-0.10
-4.11	87.17	268	-5	0.12	-0.10
-4.85	93.98	262	-4	0.14	-0.11
-1.02	77.82	318	-1	0.17	-0.05
-2.88	70.73	239	-3	0.09	-0.07
-2.77	56.83	165	-3	0.08	-0.06
-2.37	72.05	238	-1	0.14	-0.07
-4.38	90.44	265	-5	0.13	-0.10
-1.96	56.04	209	-2	0.06	-0.05
-4.46	97.28	302	-3	0.13	-0.10
-4.01	93.66	306	-5	0.12	-0.09
-2.50	80.93	273	-2	0.15	-0.07
-4.59	100.14	300	-5	0.13	-0.11
-2.63	56.16	166	-4	0.08	-0.06
-1.51	39.11	138	-1	0.05	-0.04
-5.77	102.69	254	-4	0.16	-0.13
-3.40	87.65	311	-4	0.11	-0.08
-0.66	44.53	176	-1	0.10	-0.03
-2.42	58.90	163	-1	0.13	-0.07
-5.08	119.62	325	-4	0.27	-0.14
-3.78	89.83	309	-5	0.12	-0.09
-4.26	81.03	231	-4	0.12	-0.10
-4.95	85.41	271	-5	0.06	-0.10
-4.19	87.03	269	-4	0.12	-0.10

-2.11	81.74	316	-2	0.14	-0.06
-4.11	97.09	259	-5	0.21	-0.11
-1.27	47.01	174	-2	0.08	-0.04
-2.97	64.92	202	-2	0.09	-0.07
-5.65	114.93	330	-5	0.16	-0.13
-3.30	81.39	274	-5	0.10	-0.08
-1.75	59.13	206	-1	0.11	-0.05
-4.60	92.41	264	-5	0.13	-0.11
-4.40	84.52	228	-5	0.12	-0.10
-0.28	76.46	320	0	0.19	-0.04
-0.64	103.34	293	-1	0.43	-0.09
-1.02	37.86	139	-2	0.07	-0.03
-2.94	53.54	169	-1	0.04	-0.06
-3.05	99.57	343	-2	0.19	-0.09
-3.95	93.26	307	-5	0.12	-0.09
-2.94	71.03	240	-3	0.09	-0.07
-4.58	92.74	264	-5	0.13	-0.11
-3.07	72.60	238	-4	0.09	-0.07
-1.81	59.54	206	-2	0.11	-0.05
-5.02	101.85	299	-3	0.14	-0.12
-5.08	115.99	373	-6	0.15	-0.12
-1.55	70.50	283	-2	0.11	-0.05
-2.91	58.47	165	-3	0.08	-0.07
-2.98	71.58	240	-2	0.09	-0.07
-3.13	78.79	277	-4	0.10	-0.07
-2.50	80.64	274	-2	0.15	-0.07
-1.64	86.95	311	-2	0.21	-0.07
-3.00	71.86	239	-3	0.09	-0.07
-1.87	81.86	184	-2	0.32	-0.09
-3.11	72.82	239	-3	0.09	-0.07
-0.48	88.42	352	0	0.24	-0.05
-0.79	28.85	104	-2	0.05	-0.02

Sebastian Button

From: Sebastian Button
Sent: Thursday, March 10, 2022 2:23 PM
To: Sebastian Button
Subject: Burn Instructions

Sebastian Button
Laboratory Supervisor - Portland Laboratory

From: John Voorhees <john.voorhees@usstove.com>
Sent: Monday, February 14, 2022 12:17 PM
To: Sebastian Button <sebastian.button@pfsteco.com>
Subject: RE: Pellet Stove

Great news, yes, 5522.

High-setting 5-damper open
Med-setting 3-damper 50% closed
Low-Setting 1 -damper closed

UNITED STATES STOVE CO.
151st ANNIVERSARY

JOHN D. VOORHEES
VP PRODUCT COMPLIANCE

C 503-887-4566
E johnv@usstove.com

UNITED STATES STOVE COMPANY
227 Industrial Park Road · South Pittsburg
Tennessee · 37380 · USA · usstove.com

Pre-Conditioning Data

Client:	USSC	Job #:	22-753
Model:	KP5522	Tracking #:	121
Date(s):	1/26/22 - 1/28/22	Technician:	SJB

Elapsed Time (hrs)	Flue (°F)	Catalyst Exit (°F)	Notes: Indicate initial air setting and any changes in in setting during conditioning, as well as weight and average moisture content of all fuel additions.
0	382	N/A	Added 120lbs of Pellets, Medium Heat setting
1	371	N/A	
2	373	N/A	
3	368	N/A	
4	365	N/A	
5	370	N/A	
6	372	N/A	
7	369	N/A	
8	370	N/A	
9	372	N/A	
10	371	N/A	
11	370	N/A	
12	372	N/A	
13	372	N/A	
14	373	N/A	
15	364	N/A	
16	372	N/A	
17	358	N/A	
18	360	N/A	
19	360	N/A	
20	362	N/A	
21	360	N/A	Added 100 lbs of fuel
22	372	N/A	
23	372	N/A	
24	370	N/A	
25	377	N/A	
26	375	N/A	
27	379	N/A	
28	373	N/A	
29	378	N/A	
30	370	N/A	
31	372	N/A	
32	369	N/A	
33	368	N/A	
34	373	N/A	
35	369	N/A	
36	375	N/A	
37	378	N/A	
38	372	N/A	
39	373	N/A	
40	371	N/A	
41	366	N/A	
42	369	N/A	
43	366	N/A	
44	378	N/A	
45	376	N/A	
46	387	N/A	
47	387	N/A	
48	380	N/A	
49	380	N/A	
50	385	N/A	

Signature/Date: 3/10/2022

Equations and Sample Calculations – ASTM E2779 & E2515

Client: USSC
Model: KP5522
Tracking #: 121
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 = 4.37 %
M_{Swb} = 19.2 lbs
M_{Ewb} = 0.0 lbs
0.4536 = Conversion factor from lbs to kg

M_{Bdb} = [(19.2 x 0.4536) - (0.0 x 0.4536)] (100/(100 + 4.373)

M_{Bdb} = **8.32** 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 = 4.37 %

M_{SSiwb} = 13.9 lbs

M_{ESiwb} = 6.7 lbs

0.4536 = Conversion factor from lbs to kg

M_{BSidb} = [(13.9 x 0.4536) - (6.7 x 0.4536)] (100/(100 + 4)

M_{BSidb} = **3.15** 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} = 8.32 kg

θ = 360 min

$$BR = \frac{60 \times 8.32}{360}$$

BR = **1.39** 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} = 3.15 kg
θ = 120 min

$$BR = \frac{60 \times 3.15}{120}$$

BR = **1.58** 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:

$$Fp = \frac{8.93}{11.38} = 0.785$$

$$V_s = 0.785 \times 85.49 \times 0.99 \times 0.176 \times \left(\frac{83.4 + 460}{\left(30.47 + \frac{-0.04}{13.6} \right) \times 28.78} \right)^{1/2}$$

V_s = **9.19** 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:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 9.19 \times 0.7854 \times \frac{528}{83.4 + 460} \times \frac{30.47 + \frac{-0.04}{13.6}}{29.92}$$

Q_{sd} = **25194.6** 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:

$$V_{m(std)} = 17.64 \times 68.125 \times 0.994 \times \frac{\left(30.47 + \frac{1.49}{13.6}\right)}{(62.8 + 460)}$$

$V_{m(std)}$ = **69.868** dscf

Using equation for Train B:

$$V_{m(std)} = 17.64 \times 64.067 \times 1.002 \times \frac{\left(30.47 + \frac{1.51}{13.6}\right)}{(90.1 + 460)}$$

$V_{m(std)}$ = **62.953** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 56.86 \times 0.997 \times \frac{\left(30.47 + \frac{0.00}{13.6}\right)}{(68.3 + 460)}$$

$V_{m(std)}$ = **57.671** 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 = 0.1 + 1.1 + 0.1

m_n = 1.3 mg

Using equation for Train A (remainder):

m_n = 0.1 + 2.5 + 0.1

m_n = 2.7 mg

Train A Aggregate = **4.0** mg

Using equation for Train B:

m_n = 0.1 + 4.0 + 0.0

m_n = **4.1** 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:

$$C_s = 0.001 \times \frac{4.0}{69.87}$$

C_s = **0.00006** g/dscf

For Train B:

$$C_s = 0.001 \times \frac{4.1}{62.95}$$

C_s = **0.00007** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.1}{57.67}$$

C_r = **0.000002** 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 = (0.000057 - 0.000002) x 25194.6 x 360 /60

E_T = 8.39 g

For Train B

E_T = (0.000065 - 0.000002) x 25194.6 x 360 /60

E_T = 9.58 g

Average

E = 8.99 g

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

7.5% of the average =	0.67
Train A difference =	0.60
Train B difference =	0.60

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):

$$PR = \left(\frac{360 \times 0.186 \times 9.19 \times (62.8 + 460) \times (87.5 + 460)}{1 \times 68.125 \times 8.94 \times (83.4 + 460) \times (69.3 + 460)} \right) \times 100$$

PR = 101 %

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) = 8.99 g

θ = 360 min

$PM_R = 60 \times (8.99 / 360)$

PM_R = **1.50** 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) = 8.99 g

M_{Bdb} = 8.32 kg

PM_F = 8.99 / 8.32)

PM_F = **1.08** g/kg

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:W222-0106-01
Issue No: 1

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

PO No:

Signed:

Amber Anderson
Chemist
Date of Issue: 3/9/2022

Sample Details

Sample Log No:	W222-0106-01	**Sample Date:**	
Sample Designation:	Lignetics Hardwood	**Sample Time:**	
Sample Recognized As:	Wood Pellets	**Arrival Date:**	2/23/2022

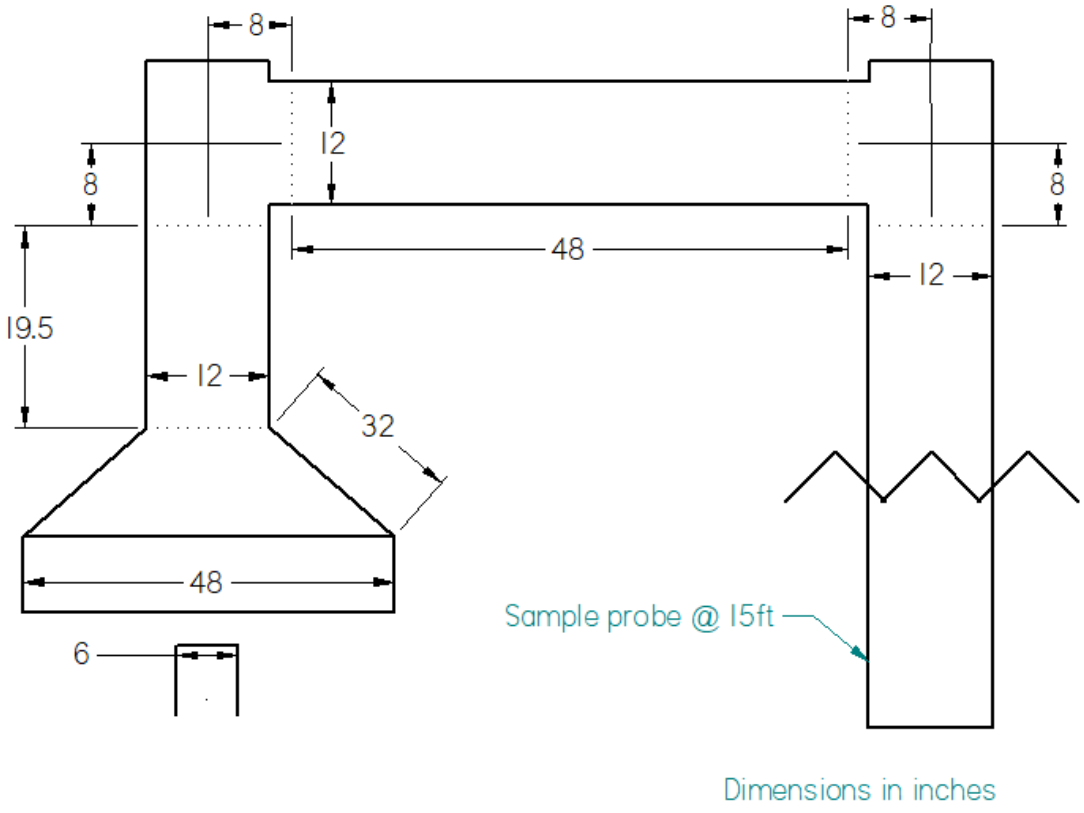
Test Results

	METHOD	UNITS	MOISTURE FREE	AS RECEIVED
Moisture Total	ASTM E871	wt. %		4.19
Ash	ASTM D1102	wt. %	0.57	0.55
Volatile Matter	ASTM D3175	wt. %		
Fixed Carbon by Difference	ASTM D3172	wt. %		
Sulfur	ASTM D4239	wt. %	0.125	0.120
SO_2	Calculated	lb/mmbtu		0.297
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	17.79	16.95
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8449	8095
Carbon	ASTM D5373	wt. %	46.54	44.59
Hydrogen*	ASTM D5373	wt. %	8.59	8.23
Nitrogen	ASTM D5373	wt. %	< 0.20	< 0.20
Oxygen*	ASTM D3176	wt. %	> 43.98	> 42.13
*Note: As received values do not include hydrogen and oxygen in the total moisture.				
Chlorine	ASTM D6721	mg/kg		
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft^3		
Fines (Less than 1/8")	TPT CH-P-06	wt.%		
Durability Index	Kansas State	PDI		
Sample Above 1.50"	TPT CH-P-06	wt.%		
Maximum Length (Single Pellet)	TPT CH-P-06	inch		
Diameter, Range	TPT CH-P-05	inch		to
Diameter, Average	TPT CH-P-05	inch		
Stated Bag Weight	TPT CH-P-01	lbs		
Actual Bag Weight	TPT CH-P-01	lbs		

Comments:

PJLA Testing
Accreditation #60243

Tunnel Schematic



PELLET TEST DATA PACKET
ASTM E2779/E2515

Run 1 Data Summary

Client: USSC
Model: KP5522
Job #: 22-753
Tracking #: 121
Test Date: 2/18/2022

Techician Signature

3/9/2022
Date

TEST RESULTS - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

Burn Rate Summary	
High Burn Rate (dry kg/hr)	2.26
Medium Burn Rate (dry kg/hr)	1.58
Low Burn Rate (dry kg/hr)	0.97
Overall Burn Rate (dry kg/hr)	1.39

Medium Burn Rate Target: < 1.62 dry kg/hr

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	56.857	68.125	64.067	11.195
Average Gas Velocity in Dilution Tunnel (ft/sec)	9.2			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	25194.6			
Average Gas Meter Temperature (°F)	68.3	62.8	90.1	68.0
Total Sample Volume (dscf)	57.671	69.868	62.953	11.368
Average Tunnel Temperature (°F)	83.4			
Total Time of Test (min)	360			
Total Particulate Catch (mg)	0.1	4.0	4.1	1.3
Particulate Concentration, dry-standard (g/dscf)	0.0000017	0.0000573	0.0000651	0.0001144
Total PM Emissions (g)	0.26	8.39	9.58	2.84
Particulate Emission Rate (g/hr)	0.04	1.40	1.60	2.84
Emissions Factor (g/kg)	-	1.01	1.15	1.25
Difference from Average Total Particulate Emissions (g)	-	0.60	0.60	-
Difference from Average Total Particulate Emissions (%)	-	6.6%	6.6%	-
Difference from Average Emissions Factor (g/kg)	-	0.07	0.07	-

Final Average Results	
Total Particulate Emissions (g)	8.99
Particulate Emission Rate (g/hr)	1.50
Emissions Factor (g/kg)	1.08
HHV Efficiency (%)	76.2%
LHV Efficiency (%)	84.2%
CO Emissions (g/min)	0.15

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	74	OK
Face Velocity	< 30 ft/min	10.6	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	66.9 / 70.2	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Medium Burn Rate	< midpoint of the high and low burn rates	1.58	OK

Overall Pellet Test Efficiency Results

Manufacturer: USSC
Model: KP5522
Date: 02/18/22
Run: 1
Control #: 22-753
Test Duration: 360
Output Category: Integrated

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	76.2%	84.2%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	76.6%	84.6%

Output Rate (kJ/h)	20,775	19,708	**(Btu/h)**
Burn Rate (kg/h)	1.39	3.06	**(lb/h)**
Input (kJ/h)	27,248	25,848	**(Btu/h)**

Test Load Weight (dry kg)	8.32	18.35	**dry lb**
MC wet (%)	4.19		
MC dry (%)	4.37		
Particulate (g)	8.99		
CO (g)	55		
Test Duration (h)	6.00		

Emissions	**Particulate**	**CO**
g/MJ Output	0.07	0.44
g/kg Dry Fuel	1.08	6.59
g/h	1.50	9.14
g/min	0.02	0.15
lb/MM Btu Output	0.17	1.02

Air/Fuel Ratio (A/F)	24.29

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

Max Burn Rate Segment Efficiency Results

Manufacturer: USSC
Model: KP5522
Date: 02/18/22
Run: 1
Control #: 22-753
Test Duration: 60
Output Category: Maximum

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	77.2%	85.3%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	77.6%	85.7%

Output Rate (kJ/h)	34,356	32,591	**(Btu/h)**
Burn Rate (kg/h)	2.26	4.99	**(lb/h)**
Input (kJ/h)	44,480	42,194	**(Btu/h)**

Test Load Weight (dry kg)	2.26	4.99	**dry lb**
MC wet (%)	4.19		
MC dry (%)	4.37		
Particulate (g)	N/A		
CO (g)	12		
Test Duration (h)	1.00		

Emissions	Particulate	CO
g/MJ Output	N/A	0.36
g/kg Dry Fuel	N/A	5.44
g/h	N/A	12.31
g/min	N/A	0.21
lb/MM Btu Output	N/A	0.83

Air/Fuel Ratio (A/F)	15.96

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

Medium Burn Rate Segment Efficiency Results

Manufacturer: USSC
Model: KP5522
Date: 02/18/22
Run: 1
Control #: 22-753
Test Duration: 120
Output Category: Medium

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	76.0%	83.9%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	76.4%	84.3%

Output Rate (kJ/h)	23,521	22,312	**(Btu/h)**
Burn Rate (kg/h)	1.58	3.47	**(lb/h)**
Input (kJ/h)	30,948	29,357	**(Btu/h)**

Test Load Weight (dry kg)	3.15	6.95	**dry lb**
MC wet (%)	4.19		
MC dry (%)	4.37		
Particulate (g)	N/A		
CO (g)	21		
Test Duration (h)	2.00		

Emissions	**Particulate**	**CO**
g/MJ Output	N/A	0.44
g/kg Dry Fuel	N/A	6.63
g/h	N/A	10.45
g/min	N/A	0.17
lb/MM Btu Output	N/A	1.03

Air/Fuel Ratio (A/F)	21.82

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

Minimum Burn Rate Segment Efficiency Results

Manufacturer: USSC
Model: KP5522
Date: 02/18/22
Run: 1
Control #: 22-753
Test Duration: 180
Output Category: Minimum

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	75.5%	83.4%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	75.9%	83.8%

Output Rate (kJ/h)	14,379	13,640	**(Btu/h)**
Burn Rate (kg/h)	0.97	2.14	**(lb/h)**
Input (kJ/h)	19,038	18,060	**(Btu/h)**

Test Load Weight (dry kg)	2.91	6.41	**dry lb**
MC wet (%)	4.19		
MC dry (%)	4.37		
Particulate (g)	N/A		
CO (g)	22		
Test Duration (h)	3.00		

Emissions	**Particulate**	**CO**
g/MJ Output	N/A	0.51
g/kg Dry Fuel	N/A	7.52
g/h	N/A	7.29
g/min	N/A	0.12
lb/MM Btu Output	N/A	1.18

Air/Fuel Ratio (A/F)	32.35

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

DILUTION TUNNEL & MISC. DATA - ASTM E2779 / E2515

Client:	USSC	Job #:	22-753
Model:	KP5522	Tracking #:	121
Run #:	1	Technician:	SJB
Test Start Time:	9:35	Date:	2/18/2022

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:	0.994	(A)
Meter Box γ Factor:	1.002	(B)
Meter Box γ Factor:	0.997	(Ambient)

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	2/17/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.47	30.47	30.47
Relative Humidity (%)	26.2	23.4	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	

Ambient Sample Volume: 56.857 ft^3

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	5	in. Hg
(B)	0.001	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.002	cfm @	5	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.012	68
2	0.018	68
3	0.019	68
4	0.024	68
5	0.022	68
6	0.017	68
7	0.016	68
8	0.018	68
9	0.022	68
10	0.022	68
11	0.020	68
12	0.014	68
Center	0.030	68

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	12	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.7854	ft^2
V_{strav}:	8.933	ft/sec
V_{scent}:	11.375	ft/sec
F_p:	0.785	[ratio]
Initial Tunnel Flow:	420.1	scf/min

Static Pressure: -0.043 in. H_2O

TEST FUEL PROPERTIES

Default Fuel Values

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

Actual Fuel Used Properties

Pellet Brand:	Lignetics
Pellet Fuel Grade:	PFI Premium
HHV (BTU/lb)	8449
%C	46.54
%H	8.59
%O	44.3
%Ash	0.57
MC (%WB)	4.19

PELLET STOVE PREBURN DATA - ASTM E2779

Client: USSC
Job #: 22-753
Model: KP5522
Tracking #: 121
Run #: 1
Technician: SJB
Date: 2/18/2022

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

		Average:	0.068	289	67
Elapsed Time (min)	Scale Reading (lbs)	Weight Change (lbs)	Flue Draft (in H_2O)	Flue (°F)	Ambient (°F)
0	44.1	-	0.020	113	66
1	43.9	-0.14	0.040	128	66
2	43.8	-0.17	0.040	159	66
3	43.6	-0.14	0.050	186	66
4	43.6	-0.07	0.050	198	66
5	43.5	-0.07	0.060	215	66
6	43.4	-0.11	0.060	231	66
7	43.3	-0.08	0.060	244	66
8	43.2	-0.09	0.060	253	66
9	43.2	-0.06	0.060	260	66
10	43.0	-0.11	0.070	269	66
11	43.0	-0.07	0.070	277	66
12	42.9	-0.1	0.070	283	67
13	42.8	-0.07	0.070	286	67
14	42.7	-0.08	0.070	288	67
15	42.6	-0.08	0.070	292	67
16	42.6	-0.09	0.070	295	67
17	42.5	-0.08	0.070	296	67
18	42.4	-0.07	0.070	297	67
19	42.3	-0.08	0.070	297	67
20	42.2	-0.08	0.070	300	67
21	42.2	-0.09	0.070	301	67
22	42.0	-0.13	0.080	301	67
23	41.9	-0.11	0.070	303	67
24	41.8	-0.09	0.080	304	67
25	41.7	-0.08	0.070	306	67
26	41.6	-0.12	0.070	306	67
27	41.6	-0.06	0.070	306	67
28	41.5	-0.1	0.070	309	68
29	41.4	-0.09	0.070	310	68
30	41.3	-0.08	0.070	310	68
31	41.2	-0.06	0.070	309	68
32	41.1	-0.1	0.070	311	68
33	41.0	-0.11	0.070	313	68
34	41.0	-0.07	0.080	313	68
35	40.9	-0.07	0.080	312	68
36	40.8	-0.11	0.070	312	68
37	40.7	-0.1	0.080	313	68
38	40.6	-0.09	0.070	313	68
39	40.5	-0.07	0.070	312	68
40	40.4	-0.09	0.070	314	68
41	40.3	-0.1	0.070	315	68
42	40.2	-0.08	0.070	315	68
43	40.2	-0.06	0.070	314	68
44	40.1	-0.11	0.070	315	68
45	40.0	-0.09	0.070	315	68
46	39.9	-0.08	0.070	315	68
47	39.8	-0.1	0.070	316	68

PELLET STOVE PREBURN DATA - ASTM E2779

Client: USSC
Job #: 22-753
Model: KP5522
Tracking #: 121
Run #: 1
Technician: SJB
Date: 2/18/2022

48	39.7	-0.06	0.070	316	68
49	39.6	-0.11	0.070	315	68
50	39.6	-0.07	0.070	315	68
51	39.5	-0.08	0.070	314	68
52	39.4	-0.08	0.080	315	68
53	39.3	-0.1	0.070	316	68
54	39.2	-0.1	0.070	316	68
55	39.1	-0.08	0.070	315	68
56	39.0	-0.1	0.070	316	68
57	39.0	-0.07	0.070	316	68
58	38.9	-0.1	0.080	317	69
59	38.8	-0.09	0.070	318	69
60	38.7	-0.09	0.070	318	69

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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		0.029	0.64	69.2	-1.39		19.2		88	319	68	68.5
1	0.186	0.186	0.029	1.52	69.3	-1.59	101	19.1	-0.1	88	319	69	68.6
2	0.377	0.191	0.028	1.51	69.4	-1.47	105	19.0	-0.1	88	318	70	68.6
3	0.566	0.189	0.029	1.50	69.4	-1.55	102	18.9	-0.1	88	317	70	68.4
4	0.757	0.191	0.029	1.50	69.4	-1.53	103	18.8	-0.1	87	318	70	68.7
5	0.946	0.189	0.028	1.50	69.5	-1.47	104	18.7	-0.1	87	317	71	68.7
6	1.135	0.189	0.029	1.50	69.4	-1.6	102	18.6	-0.1	88	316	71	68.7
7	1.323	0.188	0.030	1.48	69.4	-1.48	100	18.6	-0.1	88	315	71	68.7
8	1.511	0.188	0.029	1.48	69.3	-1.67	102	18.5	-0.1	88	314	71	68.7
9	1.699	0.188	0.029	1.48	69.3	-1.63	102	18.4	-0.1	88	313	72	68.8
10	1.887	0.188	0.030	1.48	69.4	-1.67	100	18.3	-0.1	88	314	72	68.7
11	2.075	0.188	0.031	1.49	69.3	-1.44	98	18.2	-0.1	88	316	72	68.5
12	2.262	0.187	0.031	1.48	69.3	-1.47	98	18.1	-0.1	87	316	72	68.4
13	2.449	0.187	0.030	1.48	69	-1.55	99	18.0	-0.1	87	316	72	68.2
14	2.636	0.187	0.030	1.47	68.7	-1.52	99	17.9	-0.1	87	317	72	67.7
15	2.824	0.188	0.029	1.48	68.5	-1.49	102	17.9	0.0	87	316	72	67.3
16	3.011	0.187	0.031	1.48	68.2	-1.57	98	17.8	-0.1	88	316	72	67.4
17	3.197	0.186	0.031	1.47	68	-1.45	97	17.7	-0.1	88	317	72	67.5
18	3.383	0.186	0.030	1.47	67.8	-1.58	99	17.6	-0.1	87	316	72	67.1
19	3.570	0.187	0.030	1.45	67.8	-1.43	100	17.5	-0.1	88	313	72	67.2
20	3.757	0.187	0.029	1.49	67.7	-1.42	101	17.4	-0.1	88	313	73	67.3
21	3.943	0.186	0.030	1.48	67.6	-1.51	99	17.3	-0.1	88	315	73	67.1
22	4.129	0.186	0.029	1.47	67.6	-1.58	101	17.3	-0.1	87	315	73	67.4
23	4.316	0.187	0.030	1.47	67.4	-1.58	100	17.2	-0.1	87	314	73	67.3
24	4.503	0.187	0.030	1.47	67.3	-1.65	100	17.1	-0.1	88	314	73	67.4
25	4.688	0.185	0.030	1.47	67.4	-1.47	99	17.0	-0.1	88	314	73	67.5
26	4.874	0.186	0.029	1.46	67.6	-1.65	101	16.9	-0.1	88	315	73	67.6
27	5.060	0.186	0.031	1.45	67.7	-1.59	98	16.8	-0.1	88	314	73	67.9
28	5.248	0.188	0.030	1.47	67.7	-1.55	100	16.7	-0.1	88	314	73	68
29	5.433	0.185	0.029	1.47	67.8	-1.63	100	16.6	-0.1	88	315	73	68.2
30	5.618	0.185	0.029	1.47	68	-1.42	100	16.6	-0.1	88	317	73	68.3
31	5.805	0.187	0.028	1.46	68	-1.68	103	16.5	-0.1	88	315	73	68.2
32	5.992	0.187	0.030	1.46	67.9	-1.49	100	16.4	-0.1	88	316	73	68.4
33	6.177	0.185	0.030	1.47	67.9	-1.54	99	16.3	-0.1	88	315	73	68.4

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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
34	6.362	0.185	0.030	1.46	67.8	-1.59	99	16.2	-0.1	88	316	73	68.4
35	6.549	0.187	0.030	1.47	67.9	-1.46	100	16.1	-0.1	88	315	73	68.5
36	6.735	0.186	0.030	1.47	67.8	-1.55	99	16.0	-0.1	88	316	73	68.6
37	6.920	0.185	0.030	1.46	67.8	-1.66	99	15.9	-0.1	88	319	73	68.7
38	7.105	0.185	0.030	1.46	67.8	-1.48	99	15.8	-0.1	88	319	73	68.8
39	7.293	0.188	0.029	1.46	67.8	-1.42	102	15.8	-0.1	88	319	73	68.9
40	7.478	0.185	0.031	1.46	67.8	-1.41	97	15.7	-0.1	88	319	73	69
41	7.663	0.185	0.031	1.45	67.8	-1.49	97	15.6	-0.1	88	320	74	69.1
42	7.849	0.186	0.030	1.45	67.7	-1.55	99	15.5	-0.1	88	319	74	69
43	8.036	0.187	0.030	1.46	67.5	-1.4	100	15.4	-0.1	88	319	74	69
44	8.221	0.185	0.031	1.47	67.5	-1.64	97	15.3	-0.1	88	319	74	69.1
45	8.406	0.185	0.030	1.46	67.3	-1.39	99	15.2	-0.1	88	318	74	69.1
46	8.593	0.187	0.031	1.44	67.4	-1.62	98	15.1	-0.1	88	317	74	69.1
47	8.779	0.186	0.031	1.45	67.4	-1.54	98	15.1	-0.1	88	316	74	69.3
48	8.964	0.185	0.031	1.45	67.3	-1.5	97	15.0	0.0	88	315	74	69.2
49	9.150	0.186	0.030	1.46	67.4	-1.45	99	14.9	-0.1	88	316	74	69
50	9.337	0.187	0.030	1.45	67.4	-1.5	100	14.8	-0.1	88	315	74	69.2
51	9.523	0.186	0.031	1.47	67.4	-1.65	98	14.7	-0.1	88	315	74	69.1
52	9.708	0.185	0.031	1.46	67.2	-1.51	97	14.6	-0.1	88	314	74	69.2
53	9.893	0.185	0.030	1.45	67.2	-1.39	99	14.6	-0.1	88	313	74	69.4
54	10.081	0.188	0.031	1.47	67.1	-1.47	99	14.5	-0.1	88	314	74	69.5
55	10.266	0.185	0.031	1.45	67	-1.45	97	14.4	-0.1	88	315	74	69.5
56	10.451	0.185	0.031	1.46	67	-1.39	97	14.3	-0.1	88	315	74	69.4
57	10.637	0.186	0.030	1.45	67.1	-1.42	99	14.2	-0.1	88	314	74	69.3
58	10.824	0.187	0.031	1.46	66.9	-1.65	98	14.1	-0.1	88	315	74	69.4
59	11.009	0.185	0.031	1.47	66.8	-1.39	97	14.0	-0.1	88	315	74	69.3
60	11.195	0.186	0.030	1.46	66.8	-1.44	99	13.9	-0.1	88	315	74	69.4
61	11.392	0.197	0.029	1.50	66.7	-1.47	107	13.9	0.0	88	308	72	69.4
62	11.581	0.189	0.030	1.51	66.9	-1.37	101	13.8	-0.1	87	302	71	69.4
63	11.771	0.190	0.030	1.49	66.8	-1.58	101	13.8	0.0	87	295	71	69.4
64	11.961	0.190	0.030	1.50	66.6	-1.59	101	13.7	-0.1	87	295	71	69.5
65	12.151	0.190	0.032	1.51	66.5	-1.39	98	13.7	-0.1	86	293	71	69.8
66	12.342	0.191	0.030	1.52	66.3	-1.39	102	13.6	-0.1	86	290	71	69.8
67	12.532	0.190	0.031	1.52	66.3	-1.44	100	13.5	0.0	86	287	71	69.8

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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
68	12.722	0.190	0.032	1.51	66.2	-1.52	98	13.5	0.0	86	284	71	69.9
69	12.912	0.190	0.032	1.51	66.2	-1.34	98	13.4	-0.1	86	283	71	69.6
70	13.101	0.189	0.030	1.50	66.1	-1.33	101	13.4	-0.1	86	282	71	69.5
71	13.291	0.190	0.030	1.50	66	-1.52	101	13.3	-0.1	85	280	71	69.6
72	13.481	0.190	0.031	1.50	65.9	-1.36	100	13.2	-0.1	85	280	72	69.7
73	13.670	0.189	0.030	1.51	65.8	-1.56	101	13.2	-0.1	85	277	72	69.8
74	13.860	0.190	0.031	1.50	65.7	-1.49	100	13.1	-0.1	85	278	72	69.8
75	14.050	0.190	0.031	1.51	65.6	-1.59	100	13.1	-0.1	85	277	72	69.6
76	14.241	0.191	0.032	1.51	65.7	-1.54	99	13.0	-0.1	85	278	72	69.3
77	14.431	0.190	0.032	1.51	65.7	-1.58	98	12.9	-0.1	85	277	72	69.4
78	14.621	0.190	0.031	1.51	65.6	-1.34	100	12.9	-0.1	85	277	72	69.5
79	14.811	0.190	0.031	1.50	65.7	-1.34	100	12.8	0.0	85	275	72	69.7
80	15.000	0.189	0.030	1.50	65.7	-1.48	101	12.8	-0.1	85	276	72	69.6
81	15.190	0.190	0.030	1.50	65.7	-1.36	101	12.7	-0.1	85	275	72	69.4
82	15.380	0.190	0.031	1.49	65.8	-1.52	100	12.6	-0.1	85	276	72	69.5
83	15.569	0.189	0.031	1.49	65.7	-1.46	99	12.6	-0.1	85	275	72	69.5
84	15.759	0.190	0.031	1.51	65.6	-1.6	100	12.5	-0.1	85	275	72	69.6
85	15.949	0.190	0.031	1.50	65.6	-1.47	100	12.5	0.0	85	275	72	69.5
86	16.140	0.191	0.031	1.51	65.4	-1.35	100	12.4	-0.1	85	276	72	69.6
87	16.330	0.190	0.030	1.50	65.3	-1.53	101	12.3	-0.1	85	276	72	69.5
88	16.520	0.190	0.031	1.50	65.4	-1.41	100	12.3	-0.1	85	276	72	69.6
89	16.710	0.190	0.030	1.50	65.4	-1.4	101	12.2	-0.1	85	275	72	69.6
90	16.900	0.190	0.031	1.50	65.5	-1.38	100	12.1	-0.1	85	276	72	69.7
91	17.090	0.190	0.033	1.50	65.5	-1.43	97	12.1	-0.1	85	276	72	69.6
92	17.279	0.189	0.031	1.50	65.4	-1.46	99	12.0	-0.1	85	275	72	69.5
93	17.469	0.190	0.030	1.50	65.3	-1.54	101	12.0	-0.1	85	275	73	69.4
94	17.659	0.190	0.031	1.49	65.2	-1.39	100	11.9	-0.1	85	276	73	69.6
95	17.849	0.190	0.031	1.50	65.2	-1.56	100	11.8	-0.1	85	275	73	69.5
96	18.040	0.191	0.030	1.51	65.2	-1.54	102	11.8	0.0	85	272	73	69.6
97	18.230	0.190	0.032	1.50	65.2	-1.36	98	11.7	-0.1	85	273	73	69.7
98	18.420	0.190	0.032	1.50	65.1	-1.5	98	11.7	-0.1	85	273	73	69.7
99	18.610	0.190	0.031	1.51	65.2	-1.55	100	11.6	-0.1	85	275	73	69.6
100	18.800	0.190	0.031	1.50	65.3	-1.42	100	11.5	-0.1	85	276	73	69.7
101	18.989	0.189	0.030	1.51	65.2	-1.42	101	11.5	-0.1	85	277	73	69.8

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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
102	19.179	0.190	0.030	1.49	65	-1.36	102	11.4	-0.1	85	278	73	69.6
103	19.369	0.190	0.031	1.51	65.1	-1.41	100	11.3	-0.1	85	278	73	69.6
104	19.559	0.190	0.032	1.49	65.1	-1.4	98	11.3	-0.1	85	276	73	69.7
105	19.749	0.190	0.031	1.49	65.2	-1.62	100	11.2	-0.1	85	275	73	69.7
106	19.939	0.190	0.030	1.49	65.1	-1.38	101	11.2	-0.1	85	273	73	69.7
107	20.130	0.191	0.031	1.50	65.2	-1.55	100	11.1	-0.1	85	275	73	69.8
108	20.320	0.190	0.030	1.50	65.1	-1.62	101	11.0	-0.1	85	276	73	69.9
109	20.510	0.190	0.031	1.49	65	-1.57	100	11.0	-0.1	85	275	73	69.8
110	20.699	0.189	0.031	1.50	65	-1.48	99	10.9	-0.1	85	275	73	69.7
111	20.889	0.190	0.032	1.49	65	-1.48	98	10.8	-0.1	85	276	73	70
112	21.078	0.189	0.031	1.50	65	-1.38	99	10.8	-0.1	85	273	73	69.9
113	21.268	0.190	0.031	1.49	65	-1.37	100	10.7	-0.1	85	274	73	69.9
114	21.458	0.190	0.030	1.50	65	-1.58	102	10.7	-0.1	85	273	73	70.1
115	21.648	0.190	0.031	1.50	65.1	-1.58	100	10.6	-0.1	85	273	73	69.8
116	21.838	0.190	0.031	1.50	65	-1.37	100	10.6	-0.1	85	273	73	69.8
117	22.029	0.191	0.031	1.50	64.8	-1.58	100	10.5	0.0	85	271	73	69.9
118	22.219	0.190	0.032	1.50	64.7	-1.49	98	10.4	-0.1	85	271	73	69.9
119	22.408	0.189	0.031	1.50	64.5	-1.38	99	10.4	-0.1	85	269	73	69.9
120	22.598	0.190	0.032	1.50	64.7	-1.57	98	10.3	-0.1	85	269	73	69.9
121	22.787	0.189	0.032	1.50	64.7	-1.6	98	10.3	-0.1	85	269	73	69.9
122	22.977	0.190	0.031	1.49	64.7	-1.39	100	10.2	-0.1	85	269	73	69.8
123	23.167	0.190	0.032	1.50	64.8	-1.61	98	10.2	-0.1	85	267	73	70
124	23.356	0.189	0.031	1.49	65.1	-1.5	99	10.1	-0.1	85	268	73	69.8
125	23.546	0.190	0.032	1.49	65.1	-1.58	98	10.1	0.0	84	266	73	69.9
126	23.736	0.190	0.032	1.50	65.1	-1.59	98	10.0	-0.1	84	270	73	69.7
127	23.927	0.191	0.031	1.49	64.8	-1.37	100	9.9	-0.1	84	272	73	69.4
128	24.117	0.190	0.031	1.50	64.6	-1.41	100	9.8	-0.1	85	272	73	69.5
129	24.306	0.189	0.030	1.50	64.2	-1.48	101	9.8	-0.1	85	272	73	69.2
130	24.496	0.190	0.032	1.50	63.9	-1.37	98	9.7	-0.1	85	271	73	69.2
131	24.685	0.189	0.032	1.49	63.9	-1.45	98	9.7	-0.1	85	269	73	69.2
132	24.875	0.190	0.031	1.49	63.9	-1.44	100	9.6	-0.1	85	271	73	69.3
133	25.064	0.189	0.031	1.49	63.9	-1.52	100	9.6	-0.1	85	270	73	69.3
134	25.254	0.190	0.032	1.49	64	-1.47	98	9.5	-0.1	85	273	73	69.4
135	25.444	0.190	0.032	1.49	64.1	-1.57	98	9.4	0.0	85	272	73	69.5

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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
136	25.634	0.190	0.032	1.48	64.1	-1.49	98	9.4	-0.1	85	272	73	69.5
137	25.824	0.190	0.031	1.50	64.3	-1.45	100	9.3	-0.1	85	271	73	69.7
138	26.014	0.190	0.031	1.50	64.3	-1.4	100	9.3	-0.1	85	273	73	69.7
139	26.203	0.189	0.031	1.49	64.1	-1.52	100	9.2	0.0	85	270	73	69.4
140	26.392	0.189	0.031	1.49	64.1	-1.59	100	9.1	-0.1	85	270	73	69.6
141	26.582	0.190	0.031	1.49	64.2	-1.4	100	9.1	-0.1	85	269	73	69.6
142	26.771	0.189	0.031	1.49	64.2	-1.42	99	9.0	-0.1	85	270	73	69.6
143	26.961	0.190	0.031	1.49	64.3	-1.39	100	9.0	-0.1	85	270	73	69.7
144	27.151	0.190	0.031	1.49	64.5	-1.62	100	8.9	-0.1	85	270	73	69.5
145	27.341	0.190	0.030	1.50	64.6	-1.62	102	8.8	-0.1	85	270	73	69.6
146	27.531	0.190	0.031	1.50	64.6	-1.39	100	8.8	-0.1	85	271	73	69.8
147	27.721	0.190	0.030	1.49	64.5	-1.62	102	8.7	-0.1	85	271	73	70
148	27.910	0.189	0.030	1.49	64.5	-1.36	101	8.7	-0.1	85	270	73	69.9
149	28.099	0.189	0.032	1.49	64.4	-1.42	98	8.6	-0.1	85	271	73	69.9
150	28.288	0.189	0.031	1.49	64.4	-1.63	99	8.5	-0.1	85	272	73	69.9
151	28.477	0.189	0.031	1.49	64.3	-1.46	99	8.5	-0.1	85	271	73	69.9
152	28.667	0.190	0.031	1.49	64.2	-1.59	100	8.4	0.0	85	270	73	69.9
153	28.857	0.190	0.032	1.48	64.2	-1.43	98	8.4	-0.1	85	269	73	69.9
154	29.047	0.190	0.031	1.49	64.2	-1.41	100	8.3	-0.1	85	270	73	70
155	29.236	0.189	0.031	1.48	64.3	-1.41	99	8.2	-0.1	85	272	73	70
156	29.425	0.189	0.031	1.49	64.4	-1.6	99	8.2	-0.1	85	272	73	69.9
157	29.614	0.189	0.031	1.49	64.3	-1.6	99	8.1	-0.1	85	274	73	69.9
158	29.804	0.190	0.031	1.49	64.2	-1.56	100	8.0	-0.1	85	274	73	70
159	29.993	0.189	0.030	1.48	64.4	-1.61	101	8.0	-0.1	85	276	73	69.9
160	30.182	0.189	0.030	1.49	64.4	-1.61	101	7.9	-0.1	85	275	73	70.1
161	30.371	0.189	0.032	1.48	64.3	-1.61	98	7.8	-0.1	85	277	73	70
162	30.562	0.191	0.031	1.49	64.2	-1.54	101	7.8	-0.1	85	275	73	70.2
163	30.751	0.189	0.032	1.49	64.1	-1.36	98	7.7	-0.1	85	274	74	70.2
164	30.940	0.189	0.032	1.48	64.1	-1.36	98	7.7	-0.1	85	273	74	69.9
165	31.130	0.190	0.032	1.48	64	-1.49	99	7.6	-0.1	85	271	74	69.4
166	31.319	0.189	0.032	1.48	63.7	-1.61	98	7.6	-0.1	85	272	73	69.2
167	31.507	0.188	0.032	1.48	63.6	-1.36	98	7.5	-0.1	85	273	73	69.1
168	31.697	0.190	0.031	1.48	63.2	-1.62	100	7.4	-0.1	85	273	73	68.9
169	31.886	0.189	0.032	1.48	63	-1.64	98	7.4	-0.1	85	274	73	68.9

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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
170	32.076	0.190	0.032	1.49	62.8	-1.55	99	7.3	-0.1	85	272	73	68.9
171	32.266	0.190	0.032	1.49	62.8	-1.62	99	7.3	0.0	85	270	73	68.6
172	32.455	0.189	0.031	1.48	62.7	-1.36	100	7.2	-0.1	85	268	73	68.6
173	32.644	0.189	0.032	1.49	62.4	-1.49	98	7.1	-0.1	85	269	73	68.4
174	32.833	0.189	0.032	1.48	62.4	-1.62	98	7.1	-0.1	85	269	73	68.5
175	33.022	0.189	0.031	1.49	62.1	-1.36	100	7.0	-0.1	85	270	73	68.6
176	33.211	0.189	0.031	1.47	61.9	-1.47	100	6.9	-0.1	85	271	73	68.6
177	33.400	0.189	0.031	1.48	62	-1.52	100	6.9	-0.1	85	274	73	68.4
178	33.590	0.190	0.032	1.49	62	-1.57	99	6.8	-0.1	85	273	73	68.4
179	33.779	0.189	0.030	1.49	61.7	-1.46	102	6.8	0.0	85	271	73	68.5
180	33.968	0.189	0.032	1.49	61.7	-1.57	98	6.7	-0.1	85	266	73	68.5
181	34.157	0.189	0.031	1.49	61.7	-1.41	100	6.7	0.0	84	260	73	68.5
182	34.346	0.189	0.032	1.49	61.5	-1.62	98	6.6	0.0	84	253	73	68.4
183	34.535	0.189	0.032	1.49	61.3	-1.46	98	6.6	0.0	83	249	73	68.1
184	34.724	0.189	0.031	1.46	61.1	-1.58	100	6.6	0.0	83	244	73	68
185	34.913	0.189	0.031	1.49	60.9	-1.39	100	6.5	0.0	83	241	73	68.1
186	35.104	0.191	0.031	1.48	61	-1.37	101	6.5	-0.1	83	237	72	68
187	35.292	0.188	0.032	1.49	61	-1.5	98	6.4	0.0	82	234	72	68
188	35.482	0.190	0.031	1.49	60.9	-1.54	100	6.4	0.0	82	230	72	68.2
189	35.670	0.188	0.032	1.48	60.8	-1.58	98	6.4	-0.1	82	229	72	68
190	35.859	0.189	0.032	1.47	60.7	-1.44	98	6.3	-0.1	82	230	72	68
191	36.048	0.189	0.031	1.48	60.5	-1.56	100	6.3	-0.1	82	230	72	68
192	36.237	0.189	0.032	1.48	60.5	-1.61	98	6.3	0.0	82	228	72	67.8
193	36.427	0.190	0.032	1.49	60.4	-1.39	99	6.2	-0.1	82	226	72	67.8
194	36.616	0.189	0.032	1.48	60.4	-1.61	98	6.2	0.0	82	224	72	67.9
195	36.805	0.189	0.032	1.49	60.3	-1.44	98	6.1	-0.1	82	225	72	67.8
196	36.993	0.188	0.032	1.48	60.2	-1.51	98	6.1	0.0	81	224	72	67.7
197	37.182	0.189	0.032	1.48	60	-1.51	98	6.1	0.0	81	221	72	67.7
198	37.371	0.189	0.031	1.48	60	-1.41	100	6.0	-0.1	81	220	72	67.6
199	37.560	0.189	0.032	1.47	59.8	-1.5	98	6.0	0.0	81	219	72	67.6
200	37.749	0.189	0.032	1.47	59.7	-1.55	98	5.9	-0.1	81	220	72	67.6
201	37.939	0.190	0.031	1.48	59.5	-1.42	101	5.9	0.0	81	219	71	67.6
202	38.128	0.189	0.032	1.49	59.5	-1.5	98	5.9	0.0	81	219	71	67.5
203	38.317	0.189	0.033	1.48	59.5	-1.43	97	5.8	-0.1	81	217	71	67.4

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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
204	38.505	0.188	0.032	1.48	59.5	-1.57	98	5.8	0.0	81	216	71	67.5
205	38.694	0.189	0.032	1.48	59.6	-1.48	98	5.8	-0.1	81	215	71	67.5
206	38.883	0.189	0.030	1.48	59.5	-1.55	102	5.7	-0.1	81	214	71	67.5
207	39.072	0.189	0.031	1.48	59.4	-1.61	100	5.7	-0.1	81	216	71	67.2
208	39.262	0.190	0.030	1.48	59.3	-1.64	102	5.6	0.0	81	216	71	67.3
209	39.451	0.189	0.032	1.48	59.2	-1.44	98	5.6	0.0	81	216	71	67.3
210	39.640	0.189	0.032	1.49	59.1	-1.52	98	5.6	0.0	81	215	71	67.3
211	39.828	0.188	0.032	1.47	59	-1.42	98	5.5	0.0	80	214	71	67.3
212	40.017	0.189	0.032	1.48	59	-1.44	99	5.5	0.0	80	214	71	67.2
213	40.205	0.188	0.031	1.48	59	-1.57	100	5.5	0.0	80	215	71	67.2
214	40.394	0.189	0.031	1.48	58.9	-1.66	100	5.4	0.0	80	213	71	67.2
215	40.584	0.190	0.031	1.48	58.9	-1.51	101	5.4	0.0	80	210	71	67.1
216	40.773	0.189	0.030	1.49	59.1	-1.47	102	5.3	-0.1	80	212	71	67.2
217	40.962	0.189	0.032	1.49	59	-1.59	98	5.3	-0.1	80	213	71	67.1
218	41.150	0.188	0.031	1.48	59	-1.63	100	5.3	0.0	80	213	71	67.1
219	41.339	0.189	0.031	1.48	58.9	-1.66	100	5.2	0.0	80	212	71	67.1
220	41.527	0.188	0.030	1.47	59	-1.66	101	5.2	0.0	80	212	71	67.1
221	41.716	0.189	0.032	1.48	59.1	-1.66	98	5.2	0.0	80	212	71	67.1
222	41.906	0.190	0.032	1.48	59.2	-1.57	99	5.1	0.0	80	210	71	67
223	42.094	0.188	0.031	1.48	59.1	-1.53	99	5.1	0.0	80	207	71	67
224	42.283	0.189	0.031	1.46	59.1	-1.57	100	5.1	-0.1	80	208	71	66.9
225	42.471	0.188	0.031	1.47	58.9	-1.5	100	5.0	0.0	80	207	71	67.1
226	42.659	0.188	0.031	1.47	58.9	-1.52	100	5.0	0.0	80	206	71	67.1
227	42.847	0.188	0.031	1.48	58.8	-1.65	100	5.0	0.0	80	206	71	67.1
228	43.037	0.190	0.031	1.47	58.7	-1.42	101	4.9	-0.1	80	207	71	67.2
229	43.226	0.189	0.031	1.48	58.8	-1.57	100	4.9	0.0	80	207	71	66.9
230	43.414	0.188	0.031	1.48	58.7	-1.52	100	4.8	-0.1	80	207	71	67
231	43.602	0.188	0.031	1.47	58.8	-1.68	100	4.8	0.0	80	208	71	67.1
232	43.790	0.188	0.031	1.48	58.8	-1.67	100	4.8	0.0	80	207	71	67.1
233	43.979	0.189	0.032	1.47	58.9	-1.68	98	4.7	0.0	80	205	71	67
234	44.167	0.188	0.031	1.48	59	-1.58	100	4.7	0.0	80	206	71	67
235	44.357	0.190	0.032	1.47	59.1	-1.46	99	4.7	0.0	80	207	70	67
236	44.545	0.188	0.032	1.47	59.1	-1.43	98	4.6	0.0	80	205	70	67.1
237	44.732	0.187	0.031	1.47	59.1	-1.66	99	4.6	-0.1	80	208	70	66.9

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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
238	44.920	0.188	0.031	1.48	59.1	-1.43	99	4.5	0.0	80	209	70	67
239	45.109	0.189	0.031	1.47	59.2	-1.67	100	4.5	0.0	80	210	70	66.9
240	45.297	0.188	0.032	1.48	59.2	-1.43	98	4.5	0.0	80	211	70	66.9
241	45.486	0.189	0.030	1.47	59.2	-1.45	102	4.4	-0.1	80	213	70	67
242	45.674	0.188	0.031	1.48	59.2	-1.48	99	4.4	0.0	80	212	70	67.2
243	45.862	0.188	0.030	1.47	59.1	-1.64	101	4.3	0.0	81	212	70	67.2
244	46.050	0.188	0.031	1.47	59.1	-1.67	100	4.3	-0.1	81	214	70	67.3
245	46.238	0.188	0.031	1.48	59.1	-1.49	100	4.3	0.0	81	212	70	67.1
246	46.427	0.189	0.031	1.47	59.1	-1.56	100	4.3	0.0	81	212	70	67.1
247	46.615	0.188	0.031	1.48	59.2	-1.46	100	4.2	-0.1	81	212	70	67.1
248	46.803	0.188	0.031	1.47	59.1	-1.5	100	4.1	0.0	81	213	70	67
249	46.991	0.188	0.031	1.47	59.2	-1.42	100	4.1	0.0	81	214	70	67.2
250	47.178	0.187	0.031	1.47	59.4	-1.54	99	4.1	0.0	81	213	70	67.1
251	47.366	0.188	0.031	1.47	59.4	-1.44	99	4.1	0.0	81	208	71	67.2
252	47.556	0.190	0.031	1.47	59.4	-1.59	101	4.0	-0.1	81	207	70	67.2
253	47.744	0.188	0.031	1.47	59.4	-1.56	99	4.0	-0.1	80	207	70	67.1
254	47.932	0.188	0.031	1.48	59.4	-1.63	99	4.0	0.0	80	206	70	67.1
255	48.119	0.187	0.031	1.47	59.4	-1.46	99	3.9	-0.1	80	205	70	67.1
256	48.307	0.188	0.032	1.48	59.4	-1.56	98	3.9	0.0	80	205	70	67.1
257	48.495	0.188	0.031	1.47	59.4	-1.52	99	3.8	-0.1	80	206	70	67
258	48.684	0.189	0.032	1.47	59.5	-1.63	98	3.8	0.0	80	207	70	66.9
259	48.873	0.189	0.031	1.51	59.4	-1.65	100	3.8	0.0	80	206	70	67.1
260	49.065	0.192	0.031	1.51	59.5	-1.67	102	3.7	-0.1	80	208	70	67.1
261	49.257	0.192	0.031	1.51	59.5	-1.66	102	3.7	0.0	81	209	71	67.2
262	49.449	0.192	0.032	1.52	59.6	-1.47	100	3.6	-0.1	81	210	70	67.4
263	49.640	0.191	0.032	1.52	59.5	-1.66	99	3.6	0.0	81	210	71	67.2
264	49.832	0.192	0.032	1.52	59.5	-1.57	100	3.6	0.0	81	210	71	67.2
265	50.024	0.192	0.031	1.52	59.7	-1.6	102	3.5	0.0	81	212	71	67.2
266	50.215	0.191	0.031	1.51	59.7	-1.56	101	3.5	0.0	81	212	71	67.3
267	50.407	0.192	0.031	1.52	59.7	-1.58	102	3.5	0.0	81	209	71	67.2
268	50.598	0.191	0.031	1.51	59.9	-1.56	101	3.4	0.0	81	207	71	67.2
269	50.790	0.192	0.031	1.51	59.9	-1.67	102	3.4	0.0	81	205	71	67.2
270	50.981	0.191	0.030	1.50	59.7	-1.49	103	3.4	-0.1	80	207	71	67.3
271	51.172	0.191	0.032	1.51	59.3	-1.52	99	3.3	0.0	80	206	71	67.6

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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
272	51.364	0.192	0.032	1.52	59.3	-1.48	100	3.3	-0.1	80	208	71	67.5
273	51.555	0.191	0.032	1.51	59.2	-1.48	100	3.2	0.0	80	209	71	67.3
274	51.747	0.192	0.031	1.50	59.2	-1.53	102	3.2	0.0	80	209	71	67.1
275	51.938	0.191	0.032	1.51	59.2	-1.61	100	3.2	0.0	80	211	71	67.2
276	52.130	0.192	0.031	1.51	59.2	-1.48	102	3.1	0.0	80	211	71	67.2
277	52.321	0.191	0.031	1.51	59.3	-1.47	101	3.1	-0.1	80	209	70	67.4
278	52.513	0.192	0.032	1.51	59.3	-1.64	100	3.1	0.0	81	209	71	67.3
279	52.704	0.191	0.031	1.50	59.4	-1.49	101	3.0	0.0	81	206	71	67.5
280	52.895	0.191	0.031	1.51	59.3	-1.49	101	3.0	-0.1	81	207	71	67.3
281	53.087	0.192	0.031	1.53	59.4	-1.61	102	3.0	0.0	81	207	71	67.3
282	53.278	0.191	0.031	1.51	59.5	-1.66	101	2.9	0.0	81	207	71	67.2
283	53.470	0.192	0.031	1.51	59.6	-1.59	102	2.9	-0.1	81	209	71	67.2
284	53.662	0.192	0.030	1.51	59.6	-1.58	103	2.9	0.0	81	209	71	67.2
285	53.853	0.191	0.031	1.52	59.7	-1.68	101	2.8	0.0	81	208	71	67.2
286	54.045	0.192	0.031	1.51	59.8	-1.48	102	2.8	0.0	81	208	71	67.3
287	54.236	0.191	0.031	1.51	59.7	-1.66	101	2.7	0.0	81	209	71	67.2
288	54.427	0.191	0.032	1.51	59.7	-1.68	99	2.7	0.0	81	209	71	67.1
289	54.619	0.192	0.032	1.50	59.7	-1.52	100	2.7	0.0	81	208	71	67.2
290	54.810	0.191	0.032	1.51	59.6	-1.54	99	2.6	0.0	81	208	71	67.2
291	55.001	0.191	0.030	1.51	59.8	-1.5	103	2.6	-0.1	81	208	71	67.3
292	55.192	0.191	0.030	1.51	59.8	-1.49	103	2.5	0.0	80	206	71	67.3
293	55.383	0.191	0.031	1.51	59.8	-1.65	101	2.5	0.0	80	208	71	67.2
294	55.574	0.191	0.031	1.50	59.8	-1.59	101	2.5	0.0	80	207	71	67.2
295	55.765	0.191	0.031	1.51	59.9	-1.57	101	2.5	0.0	80	205	71	67.3
296	55.956	0.191	0.031	1.51	59.8	-1.57	101	2.4	-0.1	80	204	71	67.2
297	56.147	0.191	0.031	1.50	59.8	-1.62	101	2.4	-0.1	80	209	71	67.3
298	56.338	0.191	0.032	1.50	59.9	-1.5	99	2.3	0.0	80	208	71	67.3
299	56.529	0.191	0.031	1.50	60	-1.7	101	2.3	0.0	80	207	71	67.3
300	56.720	0.191	0.031	1.51	60	-1.5	101	2.2	-0.1	81	209	71	67.3
301	56.911	0.191	0.031	1.51	59.9	-1.51	101	2.2	0.0	81	208	71	67.3
302	57.102	0.191	0.030	1.50	60	-1.5	103	2.2	-0.1	81	208	71	67.6
303	57.292	0.190	0.031	1.51	60.1	-1.55	100	2.1	0.0	81	210	71	67.5
304	57.484	0.192	0.032	1.50	60	-1.51	100	2.1	0.0	81	209	71	67.4
305	57.675	0.191	0.030	1.50	60.1	-1.58	103	2.1	-0.1	81	209	71	67.5

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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
306	57.866	0.191	0.031	1.51	60.2	-1.51	101	2.0	0.0	81	208	71	67.4
307	58.057	0.191	0.031	1.51	60.1	-1.7	101	2.0	0.0	81	208	71	67.5
308	58.248	0.191	0.031	1.50	60.1	-1.52	101	1.9	-0.1	81	211	71	67.3
309	58.438	0.190	0.031	1.51	60.1	-1.68	100	1.9	0.0	81	211	71	67.4
310	58.629	0.191	0.030	1.51	60.2	-1.66	103	1.9	0.0	81	210	71	67.4
311	58.819	0.190	0.031	1.50	60.2	-1.56	100	1.8	0.0	81	209	71	67.5
312	59.010	0.191	0.031	1.51	60.3	-1.57	101	1.8	-0.1	81	210	71	67.4
313	59.200	0.190	0.030	1.49	60.2	-1.59	102	1.8	0.0	81	212	71	67.5
314	59.390	0.190	0.031	1.49	60.2	-1.48	100	1.7	0.0	81	210	71	67.3
315	59.581	0.191	0.030	1.51	60.2	-1.64	103	1.7	-0.1	81	211	71	67.5
316	59.771	0.190	0.031	1.50	60.2	-1.65	100	1.6	0.0	81	212	71	67.6
317	59.962	0.191	0.030	1.51	60.1	-1.51	103	1.6	-0.1	82	214	71	67.6
318	60.152	0.190	0.030	1.51	60	-1.49	102	1.6	0.0	81	213	71	67.7
319	60.343	0.191	0.030	1.49	60	-1.64	103	1.5	0.0	81	211	71	67.5
320	60.535	0.192	0.030	1.49	59.8	-1.59	103	1.5	0.0	81	209	71	67.4
321	60.725	0.190	0.030	1.50	60	-1.52	102	1.5	-0.1	81	210	71	67.6
322	60.915	0.190	0.031	1.50	60	-1.62	100	1.4	0.0	81	211	71	67.6
323	61.106	0.191	0.030	1.50	60.2	-1.61	103	1.4	0.0	81	208	71	67.4
324	61.296	0.190	0.030	1.50	60.1	-1.61	102	1.4	0.0	81	206	71	67.4
325	61.486	0.190	0.030	1.50	60.2	-1.57	102	1.3	-0.1	81	206	71	67.5
326	61.676	0.190	0.031	1.49	60.3	-1.63	100	1.3	0.0	81	205	71	67.4
327	61.866	0.190	0.031	1.49	60.4	-1.64	100	1.2	0.0	81	205	71	67.4
328	62.056	0.190	0.031	1.50	60.4	-1.56	100	1.2	0.0	81	206	71	67.4
329	62.246	0.190	0.031	1.50	60.5	-1.48	100	1.2	0.0	81	207	71	67.4
330	62.436	0.190	0.031	1.48	60.6	-1.63	100	1.1	-0.1	81	208	71	67.4
331	62.627	0.191	0.030	1.49	60.5	-1.48	103	1.1	0.0	81	210	71	67.5
332	62.818	0.191	0.031	1.50	60.4	-1.67	101	1.1	0.0	81	210	71	67.5
333	63.008	0.190	0.032	1.51	60.4	-1.67	99	1.0	0.0	81	211	71	67.4
334	63.198	0.190	0.031	1.49	60.4	-1.68	100	1.0	-0.1	81	213	71	67.5
335	63.388	0.190	0.030	1.49	60.3	-1.58	102	0.9	0.0	81	211	71	67.5
336	63.577	0.189	0.031	1.49	60.3	-1.69	100	0.9	0.0	81	210	71	67.5
337	63.767	0.190	0.030	1.50	60.3	-1.72	102	0.9	0.0	81	211	71	67.6
338	63.957	0.190	0.030	1.48	60.2	-1.67	102	0.8	0.0	81	213	71	67.5
339	64.146	0.189	0.030	1.49	60	-1.55	102	0.8	-0.1	81	212	71	67.8

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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
340	64.336	0.190	0.031	1.49	60	-1.57	101	0.7	0.0	81	212	71	67.5
341	64.526	0.190	0.030	1.50	59.9	-1.56	102	0.7	0.0	81	211	71	67.5
342	64.717	0.191	0.030	1.48	60.1	-1.55	103	0.7	0.0	81	210	71	67.6
343	64.906	0.189	0.031	1.49	60.3	-1.62	100	0.6	-0.1	81	211	71	67.6
344	65.095	0.189	0.030	1.49	60.3	-1.56	102	0.6	0.0	81	210	71	67.5
345	65.285	0.190	0.031	1.49	60.3	-1.71	100	0.6	0.0	81	211	71	67.5
346	65.474	0.189	0.031	1.49	60.3	-1.49	100	0.5	0.0	81	212	71	67.5
347	65.663	0.189	0.031	1.49	60.3	-1.67	100	0.5	0.0	81	210	71	67.5
348	65.853	0.190	0.030	1.49	60.5	-1.6	102	0.5	0.0	81	208	71	67.5
349	66.042	0.189	0.030	1.47	60.5	-1.63	101	0.4	-0.1	81	211	71	67.8
350	66.232	0.190	0.030	1.51	60.4	-1.56	102	0.4	0.0	81	213	71	67.7
351	66.423	0.191	0.029	1.49	60.3	-1.72	104	0.3	0.0	81	212	71	67.6
352	66.612	0.189	0.030	1.49	60.4	-1.67	102	0.3	0.0	81	211	71	67.7
353	66.801	0.189	0.030	1.48	60.2	-1.53	102	0.3	-0.1	81	209	71	67.7
354	66.989	0.188	0.030	1.49	60.3	-1.53	101	0.2	0.0	81	211	71	67.9
355	67.178	0.189	0.029	1.47	60.2	-1.73	103	0.2	0.0	82	213	71	68.3
356	67.367	0.189	0.030	1.49	60.5	-1.57	102	0.1	0.0	82	212	71	68.3
357	67.556	0.189	0.030	1.49	60.6	-1.5	102	0.1	0.0	82	212	71	68.4
358	67.747	0.191	0.031	1.48	60.5	-1.52	101	0.1	0.0	82	212	71	68.6
359	67.936	0.189	0.030	1.48	60.7	-1.72	102	0.0	0.0	82	215	71	68.6
360	68.125	0.189	0.030	1.49	60.9	-1.73	101	0.0	0.0	82	215	71	68.8
Avg/Tot	68.125	0.189	0.031	1.49	63	-1.53	100			83	250	72	68

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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		0.65	69.3	-1.49		72	0.080	8.64	0.05
1	0.180	0.180	1.53	69.4	-1.52	109	71	0.080	7.37	0.03
2	0.356	0.176	1.51	69.4	-1.35	108	71	0.070	8.11	0.05
3	0.534	0.178	1.52	69.4	-1.52	108	71	0.070	7.29	0.04
4	0.708	0.174	1.48	69.5	-1.56	105	72	0.070	7.49	0.04
5	0.886	0.178	1.50	69.6	-1.35	109	70	0.070	6.71	0.03
6	1.060	0.174	1.49	69.7	-1.34	105	71	0.070	7.43	0.03
7	1.236	0.176	1.51	69.8	-1.33	105	71	0.070	6.81	0.03
8	1.410	0.174	1.45	70	-1.34	105	71	0.070	7.01	0.03
9	1.586	0.176	1.49	70.2	-1.47	106	71	0.080	7.46	0.03
10	1.760	0.174	1.48	70.4	-1.54	103	71	0.070	8.87	0.04
11	1.934	0.174	1.47	70.6	-1.52	102	70	0.070	9.41	0.07
12	2.109	0.175	1.48	70.7	-1.39	102	70	0.070	7.62	0.04
13	2.282	0.173	1.47	70.9	-1.32	102	71	0.070	7.81	0.03
14	2.457	0.175	1.47	71.2	-1.54	104	70	0.070	9.03	0.05
15	2.630	0.173	1.45	71.4	-1.32	104	70	0.070	6.49	0.04
16	2.803	0.173	1.47	71.6	-1.32	101	70	0.080	7.69	0.03
17	2.978	0.175	1.48	71.9	-1.31	102	71	0.080	7.69	0.03
18	3.150	0.172	1.46	72.2	-1.49	102	70	0.080	6.95	0.04
19	3.325	0.175	1.47	72.4	-1.53	103	71	0.070	6.98	0.03
20	3.499	0.174	1.46	72.7	-1.38	105	71	0.070	7.94	0.05
21	3.670	0.171	1.47	73	-1.38	101	70	0.080	6.74	0.03
22	3.845	0.175	1.47	73.2	-1.35	105	70	0.070	7.23	0.04
23	4.018	0.173	1.46	73.5	-1.43	102	70	0.070	7.17	0.03
24	4.190	0.172	1.46	73.8	-1.3	101	70	0.070	7.26	0.04
25	4.364	0.174	1.46	74	-1.55	103	71	0.070	7.52	0.03
26	4.536	0.172	1.44	74.3	-1.36	103	71	0.080	7.33	0.03
27	4.708	0.172	1.45	74.6	-1.56	100	71	0.070	7.12	0.03
28	4.882	0.174	1.44	74.9	-1.4	102	71	0.070	7.49	0.04
29	5.054	0.172	1.48	75.1	-1.5	103	71	0.070	8.68	0.05
30	5.226	0.172	1.46	75.5	-1.54	103	70	0.080	7.50	0.04
31	5.400	0.174	1.45	75.7	-1.32	106	71	0.070	7.66	0.04
32	5.572	0.172	1.45	76	-1.5	101	71	0.070	8.26	0.04

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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 (%)
33	5.744	0.172	1.46	76.4	-1.51	101	71	0.080	8.01	0.03
34	5.918	0.174	1.45	76.6	-1.39	102	71	0.080	7.36	0.03
35	6.089	0.171	1.44	77	-1.55	100	71	0.070	7.96	0.04
36	6.262	0.173	1.45	77.2	-1.54	101	71	0.080	9.17	0.06
37	6.435	0.173	1.44	77.5	-1.55	101	71	0.070	9.14	0.06
38	6.607	0.172	1.46	77.8	-1.33	101	71	0.070	7.80	0.05
39	6.779	0.172	1.45	78.1	-1.41	102	72	0.070	7.57	0.03
40	6.953	0.174	1.44	78.3	-1.43	100	70	0.080	7.47	0.04
41	7.124	0.171	1.42	78.6	-1.55	98	70	0.080	7.56	0.04
42	7.296	0.172	1.45	78.9	-1.56	100	70	0.080	7.38	0.03
43	7.470	0.174	1.45	79.2	-1.55	102	71	0.070	7.44	0.03
44	7.642	0.172	1.42	79.5	-1.55	99	72	0.080	8.16	0.04
45	7.814	0.172	1.47	79.7	-1.55	100	71	0.080	7.06	0.04
46	7.987	0.173	1.45	80	-1.51	99	71	0.080	7.07	0.04
47	8.159	0.172	1.42	80.2	-1.36	99	70	0.080	6.27	0.04
48	8.331	0.172	1.45	80.5	-1.31	99	70	0.070	7.31	0.04
49	8.505	0.174	1.44	80.8	-1.55	101	70	0.070	7.72	0.03
50	8.677	0.172	1.43	81	-1.55	100	70	0.070	7.41	0.03
51	8.849	0.172	1.46	81.4	-1.53	98	71	0.080	6.90	0.03
52	9.023	0.174	1.44	81.6	-1.36	100	70	0.070	7.61	0.03
53	9.195	0.172	1.46	81.8	-1.33	100	70	0.070	7.11	0.03
54	9.367	0.172	1.47	82.1	-1.32	98	70	0.070	7.82	0.04
55	9.541	0.174	1.44	82.3	-1.51	99	70	0.080	8.09	0.03
56	9.713	0.172	1.46	82.6	-1.3	98	70	0.080	7.60	0.03
57	9.885	0.172	1.46	82.8	-1.32	100	71	0.070	8.63	0.06
58	10.061	0.176	1.54	83	-1.55	100	70	0.070	8.43	0.05
59	10.239	0.178	1.54	83.2	-1.58	101	71	0.070	7.02	0.04
60	10.418	0.179	1.52	83.5	-1.36	104	70	0.070	7.53	0.03
61	10.597	0.179	1.54	83.7	-1.54	105	70	0.070	8.79	0.07
62	10.775	0.178	1.52	83.9	-1.54	103	70	0.070	5.55	0.03
63	10.955	0.180	1.52	84.1	-1.59	104	70	0.070	5.82	0.03
64	11.133	0.178	1.54	84.3	-1.51	103	70	0.070	6.50	0.04
65	11.312	0.179	1.54	84.6	-1.59	100	71	0.070	7.03	0.05

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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 (%)
66	11.492	0.180	1.54	84.8	-1.35	104	71	0.070	6.07	0.04
67	11.670	0.178	1.56	85	-1.51	101	70	0.070	5.36	0.03
68	11.851	0.181	1.53	85.2	-1.47	101	71	0.080	4.77	0.02
69	12.029	0.178	1.53	85.4	-1.59	99	71	0.080	5.92	0.04
70	12.207	0.178	1.53	85.6	-1.58	102	70	0.080	4.51	0.03
71	12.388	0.181	1.54	85.8	-1.58	104	70	0.070	5.20	0.02
72	12.566	0.178	1.53	86	-1.48	101	69	0.070	6.98	0.05
73	12.746	0.180	1.51	86.1	-1.58	103	69	0.070	5.35	0.03
74	12.925	0.179	1.51	86.3	-1.59	101	69	0.070	5.82	0.04
75	13.104	0.179	1.56	86.5	-1.35	101	69	0.070	6.07	0.03
76	13.285	0.181	1.54	86.7	-1.39	101	69	0.070	6.44	0.04
77	13.463	0.178	1.55	86.9	-1.37	99	70	0.070	5.21	0.03
78	13.642	0.179	1.56	87	-1.49	101	70	0.070	5.11	0.03
79	13.823	0.181	1.55	87.2	-1.35	102	69	0.060	4.63	0.04
80	14.001	0.178	1.54	87.4	-1.43	102	70	0.070	6.72	0.04
81	14.181	0.180	1.55	87.5	-1.42	103	70	0.070	5.68	0.04
82	14.361	0.180	1.53	87.7	-1.57	101	70	0.070	6.28	0.03
83	14.540	0.179	1.55	87.8	-1.45	101	70	0.070	5.80	0.03
84	14.721	0.181	1.53	88	-1.36	102	70	0.070	5.73	0.03
85	14.900	0.179	1.53	88.1	-1.57	101	70	0.070	6.08	0.03
86	15.079	0.179	1.55	88.3	-1.45	101	69	0.070	6.36	0.05
87	15.260	0.181	1.53	88.5	-1.34	104	70	0.070	5.65	0.05
88	15.439	0.179	1.55	88.6	-1.48	101	70	0.060	5.50	0.03
89	15.618	0.179	1.54	88.8	-1.53	102	69	0.070	4.74	0.03
90	15.800	0.182	1.51	88.9	-1.34	102	70	0.070	5.65	0.04
91	15.978	0.178	1.56	89	-1.35	97	69	0.070	5.64	0.03
92	16.158	0.180	1.54	89.1	-1.47	101	70	0.070	6.51	0.04
93	16.339	0.181	1.53	89.3	-1.6	103	70	0.070	5.83	0.03
94	16.517	0.178	1.53	89.4	-1.57	100	69	0.070	6.25	0.04
95	16.698	0.181	1.57	89.6	-1.59	102	70	0.070	6.02	0.04
96	16.878	0.180	1.53	89.7	-1.53	103	70	0.070	4.52	0.03
97	17.057	0.179	1.53	89.7	-1.43	99	70	0.070	5.46	0.02
98	17.238	0.181	1.53	89.9	-1.43	100	70	0.070	5.40	0.03

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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 (%)
99	17.417	0.179	1.54	90	-1.36	100	70	0.070	5.28	0.02
100	17.596	0.179	1.56	90.1	-1.41	100	70	0.070	6.86	0.03
101	17.778	0.182	1.52	90.2	-1.54	104	70	0.070	4.63	0.04
102	17.957	0.179	1.53	90.3	-1.4	102	69	0.070	6.64	0.04
103	18.136	0.179	1.54	90.4	-1.41	100	70	0.070	5.99	0.03
104	18.317	0.181	1.54	90.6	-1.58	100	70	0.070	4.70	0.03
105	18.496	0.179	1.52	90.7	-1.4	100	70	0.070	5.12	0.03
106	18.676	0.180	1.54	90.7	-1.36	103	70	0.070	5.16	0.02
107	18.856	0.180	1.52	90.8	-1.55	101	70	0.070	6.50	0.06
108	19.035	0.179	1.54	90.9	-1.6	102	70	0.070	5.16	0.03
109	19.216	0.181	1.53	91.1	-1.6	101	70	0.070	5.70	0.03
110	19.396	0.180	1.55	91.2	-1.35	101	70	0.070	5.72	0.03
111	19.575	0.179	1.52	91.2	-1.35	99	70	0.070	6.32	0.06
112	19.756	0.181	1.52	91.4	-1.56	101	70	0.070	4.85	0.03
113	19.935	0.179	1.53	91.4	-1.46	100	71	0.070	6.22	0.04
114	20.114	0.179	1.53	91.5	-1.54	102	70	0.070	4.84	0.03
115	20.295	0.181	1.53	91.6	-1.42	101	70	0.070	5.89	0.05
116	20.475	0.180	1.55	91.7	-1.43	101	71	0.070	4.56	0.02
117	20.654	0.179	1.54	91.8	-1.4	100	70	0.070	5.03	0.02
118	20.835	0.181	1.54	91.9	-1.35	100	70	0.070	5.64	0.04
119	21.014	0.179	1.54	91.9	-1.39	100	70	0.070	4.61	0.03
120	21.194	0.180	1.52	92	-1.39	99	70	0.070	5.10	0.03
121	21.375	0.181	1.53	92	-1.39	100	69	0.070	4.03	0.03
122	21.553	0.178	1.54	92.2	-1.58	100	69	0.070	5.51	0.03
123	21.734	0.181	1.55	92.3	-1.46	100	69	0.070	4.53	0.03
124	21.914	0.180	1.53	92.3	-1.48	101	70	0.060	4.81	0.03
125	22.093	0.179	1.53	92.3	-1.36	98	71	0.070	4.91	0.03
126	22.274	0.181	1.53	92.4	-1.54	100	70	0.070	6.17	0.04
127	22.453	0.179	1.54	92.5	-1.58	100	69	0.070	6.60	0.04
128	22.632	0.179	1.56	92.6	-1.57	100	71	0.070	5.45	0.03
129	22.814	0.182	1.56	92.6	-1.38	103	70	0.070	4.47	0.03
130	22.993	0.179	1.55	92.6	-1.46	98	71	0.070	6.15	0.03
131	23.172	0.179	1.53	92.8	-1.55	98	70	0.070	4.85	0.02

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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 (%)
132	23.353	0.181	1.54	92.8	-1.54	101	70	0.070	5.72	0.04
133	23.532	0.179	1.51	92.8	-1.47	100	70	0.060	5.08	0.03
134	23.711	0.179	1.55	93	-1.35	98	71	0.070	6.55	0.05
135	23.893	0.182	1.52	93	-1.59	100	70	0.070	4.76	0.03
136	24.072	0.179	1.54	93	-1.36	98	70	0.060	6.01	0.03
137	24.251	0.179	1.55	93.1	-1.43	100	69	0.070	4.98	0.02
138	24.432	0.181	1.54	93.2	-1.42	101	69	0.070	5.21	0.03
139	24.611	0.179	1.53	93.2	-1.36	100	70	0.070	4.90	0.03
140	24.792	0.181	1.53	93.3	-1.4	101	70	0.070	4.76	0.03
141	24.972	0.180	1.51	93.3	-1.51	100	70	0.070	5.08	0.02
142	25.150	0.178	1.55	93.4	-1.37	99	70	0.070	5.89	0.03
143	25.332	0.182	1.53	93.4	-1.53	102	69	0.070	4.85	0.03
144	25.511	0.179	1.54	93.4	-1.35	100	70	0.080	6.96	0.05
145	25.690	0.179	1.53	93.5	-1.6	102	71	0.070	4.61	0.03
146	25.871	0.181	1.54	93.5	-1.51	101	69	0.070	5.98	0.04
147	26.050	0.179	1.55	93.6	-1.45	101	70	0.070	5.51	0.03
148	26.229	0.179	1.55	93.7	-1.56	101	70	0.070	5.29	0.03
149	26.410	0.181	1.54	93.6	-1.45	99	70	0.070	4.60	0.03
150	26.589	0.179	1.52	93.7	-1.57	100	70	0.070	6.74	0.05
151	26.768	0.179	1.52	93.8	-1.58	100	70	0.070	5.99	0.03
152	26.949	0.181	1.52	93.8	-1.54	101	69	0.070	5.06	0.03
153	27.127	0.178	1.55	93.8	-1.57	98	69	0.070	5.11	0.03
154	27.308	0.181	1.53	93.9	-1.56	101	70	0.070	5.76	0.02
155	27.487	0.179	1.52	93.9	-1.47	100	70	0.070	6.25	0.05
156	27.666	0.179	1.52	93.9	-1.58	100	70	0.070	6.05	0.04
157	27.847	0.181	1.53	93.9	-1.46	101	71	0.070	5.46	0.04
158	28.026	0.179	1.53	94.1	-1.57	100	70	0.070	5.58	0.03
159	28.204	0.178	1.53	94.1	-1.47	101	71	0.070	4.45	0.03
160	28.385	0.181	1.54	94.1	-1.38	103	69	0.070	5.61	0.03
161	28.564	0.179	1.52	94.2	-1.46	98	70	0.070	5.57	0.03
162	28.744	0.180	1.52	94.2	-1.46	100	70	0.070	5.19	0.03
163	28.924	0.180	1.53	94.2	-1.5	99	70	0.070	6.10	0.03
164	29.102	0.178	1.53	94.1	-1.56	98	70	0.070	4.92	0.03

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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 (%)
165	29.283	0.181	1.52	94.2	-1.56	99	70	0.070	4.44	0.03
166	29.462	0.179	1.54	94.2	-1.56	98	70	0.070	4.97	0.03
167	29.640	0.178	1.52	94.3	-1.58	98	69	0.070	6.17	0.04
168	29.821	0.181	1.53	94.3	-1.59	101	69	0.070	5.23	0.02
169	30.000	0.179	1.50	94.4	-1.53	98	69	0.070	7.21	0.04
170	30.179	0.179	1.53	94.5	-1.41	98	69	0.080	4.26	0.03
171	30.360	0.181	1.51	94.5	-1.37	99	70	0.070	6.09	0.03
172	30.538	0.178	1.54	94.5	-1.51	99	70	0.070	4.08	0.04
173	30.719	0.181	1.50	94.5	-1.47	99	69	0.070	6.21	0.03
174	30.898	0.179	1.53	94.5	-1.52	98	70	0.070	4.81	0.03
175	31.076	0.178	1.51	94.5	-1.4	99	70	0.070	6.26	0.04
176	31.257	0.181	1.52	94.6	-1.57	101	71	0.070	6.12	0.03
177	31.436	0.179	1.56	94.6	-1.47	100	70	0.070	7.27	0.05
178	31.615	0.179	1.53	94.6	-1.56	98	70	0.070	4.93	0.03
179	31.796	0.181	1.53	94.6	-1.54	102	69	0.070	5.01	0.03
180	31.974	0.178	1.51	94.6	-1.39	98	69	0.070	4.71	0.02
181	32.154	0.180	1.54	94.7	-1.4	100	69	0.070	5.03	0.04
182	32.334	0.180	1.54	94.6	-1.39	99	69	0.070	4.05	0.02
183	32.512	0.178	1.52	94.7	-1.54	97	70	0.060	4.24	0.02
184	32.693	0.181	1.53	94.6	-1.54	101	71	0.060	4.38	0.03
185	32.872	0.179	1.55	94.6	-1.49	99	69	0.060	2.88	0.03
186	33.051	0.179	1.52	94.7	-1.59	99	70	0.060	3.41	0.02
187	33.231	0.180	1.51	94.7	-1.56	98	70	0.060	4.61	0.03
188	33.410	0.179	1.52	94.7	-1.45	99	70	0.060	3.53	0.02
189	33.590	0.180	1.53	94.7	-1.41	98	69	0.060	2.95	0.03
190	33.770	0.180	1.52	94.6	-1.38	98	70	0.050	4.87	0.03
191	33.948	0.178	1.52	94.6	-1.4	99	70	0.060	3.79	0.02
192	34.129	0.181	1.52	94.7	-1.38	99	69	0.050	4.70	0.03
193	34.308	0.179	1.53	94.7	-1.45	98	69	0.050	3.45	0.02
194	34.486	0.178	1.55	94.8	-1.5	97	69	0.060	3.31	0.02
195	34.667	0.181	1.54	94.7	-1.58	99	71	0.060	4.88	0.02
196	34.846	0.179	1.54	94.7	-1.59	98	69	0.060	4.45	0.02
197	35.026	0.180	1.54	94.8	-1.59	98	69	0.050	3.29	0.02

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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 (%)
198	35.206	0.180	1.50	94.7	-1.6	100	70	0.060	3.33	0.02
199	35.384	0.178	1.53	94.7	-1.49	97	70	0.050	4.99	0.05
200	35.565	0.181	1.52	94.7	-1.38	99	70	0.060	3.33	0.02
201	35.743	0.178	1.53	94.7	-1.49	99	69	0.060	4.15	0.02
202	35.922	0.179	1.53	94.7	-1.46	98	70	0.050	3.99	0.01
203	36.103	0.181	1.53	94.7	-1.46	97	69	0.050	3.84	0.02
204	36.281	0.178	1.53	94.7	-1.37	97	69	0.060	3.69	0.02
205	36.461	0.180	1.54	94.6	-1.36	98	69	0.050	3.27	0.01
206	36.641	0.180	1.53	94.7	-1.46	101	70	0.050	3.99	0.01
207	36.819	0.178	1.56	94.6	-1.5	99	70	0.050	4.32	0.02
208	37.000	0.181	1.54	94.6	-1.47	102	70	0.050	4.27	0.03
209	37.178	0.178	1.52	94.7	-1.52	97	69	0.060	3.97	0.02
210	37.357	0.179	1.55	94.6	-1.54	98	70	0.060	3.48	0.01
211	37.538	0.181	1.52	94.6	-1.51	99	70	0.050	3.66	0.01
212	37.716	0.178	1.53	94.6	-1.43	97	70	0.050	3.70	0.03
213	37.896	0.180	1.53	94.7	-1.54	100	70	0.050	4.79	0.03
214	38.076	0.180	1.51	94.6	-1.47	100	70	0.050	2.83	0.03
215	38.254	0.178	1.53	94.6	-1.38	99	70	0.050	2.33	0.05
216	38.435	0.181	1.51	94.5	-1.36	102	70	0.060	4.27	0.02
217	38.613	0.178	1.54	94.6	-1.53	97	69	0.060	4.35	0.02
218	38.792	0.179	1.51	94.6	-1.59	99	70	0.050	5.00	0.04
219	38.972	0.180	1.52	94.6	-1.53	100	70	0.060	3.51	0.02
220	39.151	0.179	1.55	94.6	-1.59	101	69	0.050	4.04	0.02
221	39.330	0.179	1.51	94.6	-1.6	98	69	0.050	2.81	0.03
222	39.510	0.180	1.53	94.5	-1.38	98	70	0.060	3.78	0.02
223	39.688	0.178	1.54	94.5	-1.51	99	69	0.050	3.16	0.01
224	39.869	0.181	1.53	94.5	-1.49	100	69	0.050	3.10	0.01
225	40.047	0.178	1.52	94.5	-1.56	99	70	0.050	4.54	0.02
226	40.226	0.179	1.52	94.5	-1.58	99	70	0.050	3.29	0.01
227	40.406	0.180	1.52	94.5	-1.39	100	69	0.050	4.88	0.04
228	40.584	0.178	1.52	94.5	-1.6	99	68	0.060	3.63	0.01
229	40.764	0.180	1.51	94.5	-1.59	100	70	0.050	4.17	0.02
230	40.943	0.179	1.54	94.5	-1.61	99	69	0.050	3.33	0.02

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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 (%)
231	41.121	0.178	1.52	94.4	-1.41	99	70	0.060	4.86	0.03
232	41.301	0.180	1.51	94.4	-1.57	100	69	0.050	4.05	0.02
233	41.479	0.178	1.50	94.5	-1.42	97	70	0.050	2.48	0.03
234	41.659	0.180	1.53	94.4	-1.59	100	70	0.050	3.39	0.01
235	41.838	0.179	1.50	94.4	-1.46	98	70	0.060	4.42	0.02
236	42.016	0.178	1.53	94.4	-1.6	97	70	0.050	4.04	0.02
237	42.196	0.180	1.51	94.3	-1.38	100	69	0.050	4.36	0.03
238	42.374	0.178	1.51	94.3	-1.54	99	69	0.060	5.29	0.05
239	42.553	0.179	1.51	94.3	-1.41	99	70	0.050	3.64	0.04
240	42.733	0.180	1.51	94.3	-1.56	98	69	0.050	3.59	0.02
241	42.910	0.177	1.51	94.3	-1.41	100	70	0.050	4.94	0.04
242	43.091	0.181	1.52	94.3	-1.38	100	69	0.060	3.55	0.02
243	43.269	0.178	1.52	94.3	-1.59	100	70	0.050	4.48	0.03
244	43.448	0.179	1.51	94.3	-1.37	99	68	0.060	3.90	0.02
245	43.627	0.179	1.52	94.3	-1.41	99	69	0.050	3.27	0.03
246	43.805	0.178	1.54	94.4	-1.39	99	69	0.060	3.32	0.03
247	43.985	0.180	1.51	94.3	-1.61	100	70	0.050	3.27	0.02
248	44.162	0.177	1.51	94.3	-1.42	98	69	0.060	4.70	0.03
249	44.341	0.179	1.52	94.3	-1.5	99	70	0.050	4.37	0.02
250	44.520	0.179	1.49	94.3	-1.58	99	69	0.060	3.78	0.02
251	44.698	0.178	1.53	94.2	-1.58	99	69	0.060	2.66	0.02
252	44.878	0.180	1.52	94.2	-1.61	100	69	0.050	2.55	0.03
253	45.056	0.178	1.51	94.2	-1.37	99	69	0.050	2.91	0.03
254	45.235	0.179	1.51	94.2	-1.6	99	70	0.050	4.52	0.02
255	45.414	0.179	1.53	94.2	-1.58	99	69	0.050	2.77	0.04
256	45.592	0.178	1.51	94.2	-1.59	97	69	0.050	2.96	0.01
257	45.772	0.180	1.54	94.1	-1.6	100	69	0.050	3.52	0.02
258	45.949	0.177	1.52	94.1	-1.38	97	70	0.050	5.09	0.05
259	46.129	0.180	1.50	94.1	-1.42	100	70	0.050	2.57	0.03
260	46.307	0.178	1.51	94.2	-1.63	99	69	0.050	4.43	0.02
261	46.485	0.178	1.50	94.2	-1.38	99	70	0.050	4.69	0.03
262	46.665	0.180	1.52	94.2	-1.39	98	69	0.050	3.28	0.03
263	46.842	0.177	1.54	94.2	-1.63	97	69	0.050	3.99	0.02

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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 (%)
264	47.022	0.180	1.50	94.2	-1.48	98	69	0.050	3.58	0.02
265	47.200	0.178	1.52	94.1	-1.51	99	70	0.050	3.23	0.02
266	47.377	0.177	1.51	94.1	-1.48	98	69	0.060	5.42	0.03
267	47.557	0.180	1.51	94.2	-1.4	100	69	0.050	2.80	0.03
268	47.734	0.177	1.53	94.2	-1.41	98	70	0.050	2.54	0.02
269	47.913	0.179	1.49	94.1	-1.5	99	69	0.050	3.41	0.01
270	48.090	0.177	1.49	94.1	-1.55	100	69	0.050	4.31	0.03
271	48.269	0.179	1.51	94.1	-1.42	98	69	0.050	3.27	0.03
272	48.448	0.179	1.50	94.1	-1.46	98	69	0.060	3.59	0.02
273	48.625	0.177	1.53	94.1	-1.51	97	69	0.050	4.34	0.03
274	48.805	0.180	1.51	94.1	-1.63	100	69	0.060	2.95	0.02
275	48.982	0.177	1.51	94.1	-1.63	97	69	0.060	4.24	0.02
276	49.162	0.180	1.51	94.2	-1.38	100	70	0.050	4.70	0.04
277	49.339	0.177	1.50	94.1	-1.59	98	69	0.050	2.95	0.03
278	49.517	0.178	1.49	94.2	-1.62	97	69	0.050	3.50	0.02
279	49.696	0.179	1.52	94.1	-1.43	99	69	0.050	3.59	0.02
280	49.873	0.177	1.51	94.2	-1.49	98	69	0.050	2.45	0.03
281	50.053	0.180	1.51	94.1	-1.43	100	69	0.050	4.58	0.02
282	50.230	0.177	1.52	94.1	-1.49	98	70	0.050	3.76	0.02
283	50.409	0.179	1.50	94.1	-1.56	99	69	0.050	4.09	0.02
284	50.587	0.178	1.51	94.1	-1.64	100	70	0.050	4.04	0.03
285	50.765	0.178	1.50	94.1	-1.41	99	70	0.040	3.59	0.02
286	50.944	0.179	1.51	94.1	-1.39	99	69	0.050	2.89	0.01
287	51.120	0.176	1.53	94.1	-1.49	98	70	0.050	3.23	0.02
288	51.300	0.180	1.50	94	-1.5	98	69	0.050	4.28	0.02
289	51.477	0.177	1.50	94	-1.54	97	69	0.050	3.93	0.02
290	51.656	0.179	1.50	94.1	-1.55	98	69	0.050	3.59	0.02
291	51.834	0.178	1.50	94.1	-1.42	100	70	0.050	3.88	0.03
292	52.011	0.177	1.50	94.1	-1.4	100	70	0.060	2.68	0.03
293	52.190	0.179	1.53	94.1	-1.61	99	69	0.050	4.31	0.02
294	52.367	0.177	1.49	94.1	-1.63	98	69	0.060	3.16	0.02
295	52.546	0.179	1.49	94.2	-1.61	99	70	0.050	3.06	0.02
296	52.723	0.177	1.52	94.1	-1.45	98	68	0.050	3.93	0.02

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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 (%)
297	52.902	0.179	1.52	94.1	-1.63	99	69	0.050	5.06	0.04
298	53.079	0.177	1.49	94.1	-1.58	97	69	0.050	3.39	0.02
299	53.257	0.178	1.51	94.1	-1.53	99	69	0.050	4.15	0.02
300	53.435	0.178	1.51	94	-1.47	99	69	0.050	2.22	0.07
301	53.612	0.177	1.51	94	-1.56	98	69	0.050	4.08	0.02
302	53.791	0.179	1.50	94	-1.49	101	69	0.050	3.66	0.01
303	53.967	0.176	1.51	94	-1.5	98	69	0.050	3.73	0.02
304	54.147	0.180	1.49	94.1	-1.5	98	69	0.050	4.16	0.03
305	54.323	0.176	1.49	94.1	-1.51	99	69	0.040	3.83	0.02
306	54.502	0.179	1.51	94.1	-1.5	99	70	0.050	3.29	0.02
307	54.679	0.177	1.47	94.1	-1.42	98	69	0.060	2.89	0.02
308	54.857	0.178	1.50	94	-1.63	99	69	0.050	5.30	0.04
309	55.034	0.177	1.49	94	-1.57	98	69	0.060	3.88	0.02
310	55.211	0.177	1.52	94	-1.4	100	69	0.050	3.11	0.02
311	55.390	0.179	1.50	94.1	-1.39	99	69	0.050	3.67	0.03
312	55.566	0.176	1.48	94.1	-1.58	98	69	0.060	3.13	0.02
313	55.745	0.179	1.49	94.1	-1.59	101	69	0.050	4.54	0.02
314	55.921	0.176	1.50	94.1	-1.64	98	68	0.050	3.38	0.02
315	56.100	0.179	1.49	94.1	-1.53	101	69	0.060	3.66	0.02
316	56.277	0.177	1.50	94.1	-1.61	98	69	0.050	3.87	0.03
317	56.456	0.179	1.50	94	-1.45	101	69	0.050	3.31	0.02
318	56.632	0.176	1.49	94.1	-1.47	99	69	0.060	3.23	0.02
319	56.810	0.178	1.51	94.1	-1.39	100	69	0.050	4.12	0.02
320	56.987	0.177	1.49	94.2	-1.45	100	69	0.050	2.52	0.02
321	57.164	0.177	1.50	94.2	-1.41	100	69	0.050	4.12	0.02
322	57.343	0.179	1.48	94.1	-1.4	99	68	0.050	4.97	0.04
323	57.519	0.176	1.50	94.2	-1.41	99	69	0.050	2.85	0.03
324	57.698	0.179	1.49	94.2	-1.58	101	69	0.050	2.75	0.03
325	57.874	0.176	1.50	94.2	-1.53	99	69	0.060	3.82	0.02
326	58.053	0.179	1.51	94.2	-1.51	99	70	0.040	2.89	0.02
327	58.229	0.176	1.48	94.2	-1.4	98	69	0.050	3.34	0.01
328	58.408	0.179	1.51	94.2	-1.39	99	69	0.060	3.24	0.02
329	58.584	0.176	1.50	94.2	-1.45	98	69	0.050	4.63	0.03

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

	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 (%)
330	58.762	0.178	1.48	94.2	-1.63	99	69	0.050	2.73	0.03
331	58.939	0.177	1.49	94.3	-1.49	100	69	0.060	4.42	0.03
332	59.116	0.177	1.51	94.2	-1.41	98	68	0.050	3.39	0.02
333	59.293	0.177	1.50	94.3	-1.42	97	69	0.050	3.06	0.02
334	59.469	0.176	1.50	94.2	-1.63	98	69	0.060	3.87	0.02
335	59.648	0.179	1.49	94.2	-1.41	101	69	0.050	4.06	0.03
336	59.824	0.176	1.50	94.2	-1.45	98	69	0.050	3.02	0.02
337	60.002	0.178	1.50	94.3	-1.45	100	68	0.060	2.82	0.02
338	60.178	0.176	1.49	94.3	-1.62	99	69	0.060	5.61	0.05
339	60.356	0.178	1.49	94.2	-1.64	100	68	0.050	3.05	0.06
340	60.532	0.176	1.49	94.2	-1.62	98	69	0.050	4.41	0.03
341	60.710	0.178	1.49	94.3	-1.44	100	69	0.060	3.48	0.01
342	60.885	0.175	1.50	94.3	-1.5	99	69	0.060	3.94	0.03
343	61.064	0.179	1.50	94.3	-1.4	99	70	0.050	3.70	0.02
344	61.239	0.175	1.49	94.3	-1.59	99	69	0.050	3.82	0.02
345	61.418	0.179	1.48	94.3	-1.64	99	69	0.060	3.03	0.02
346	61.593	0.175	1.48	94.2	-1.42	97	69	0.050	3.71	0.02
347	61.771	0.178	1.49	94.3	-1.48	99	68	0.050	3.97	0.03
348	61.947	0.176	1.51	94.2	-1.42	99	68	0.050	3.10	0.02
349	62.125	0.178	1.51	94.3	-1.44	100	68	0.050	3.57	0.02
350	62.301	0.176	1.48	94.3	-1.65	99	69	0.050	5.17	0.03
351	62.478	0.177	1.49	94.3	-1.55	102	68	0.050	2.99	0.02
352	62.654	0.176	1.48	94.3	-1.42	99	69	0.050	3.78	0.02
353	62.831	0.177	1.50	94.3	-1.63	100	69	0.060	4.02	0.02
354	63.008	0.177	1.49	94.3	-1.44	100	69	0.060	3.88	0.03
355	63.185	0.177	1.46	94.3	-1.42	102	68	0.050	4.25	0.04
356	63.361	0.176	1.48	94.3	-1.58	99	68	0.050	3.77	0.02
357	63.538	0.177	1.48	94.3	-1.5	100	68	0.050	2.29	0.05
358	63.714	0.176	1.50	94.3	-1.65	98	68	0.060	3.67	0.02
359	63.891	0.177	1.49	94.2	-1.41	100	68	0.060	5.15	0.05
360	64.067	0.176	1.49	94.3	-1.6	99	68	0.050	4.34	0.03
Avg/Tot	64.067	0.178	1.51	90	-1.48	100			5.01	0.03

LAB SAMPLE DATA - ASTM E2515

Client: USSC
Model: KP5522
Run #: 1

Job #: 22-753
Tracking #: 121
Technician: SJB
Date: 2/18/2022

		Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Filters	**A - 1st Hour**	G00305	123.3	246.6	247.7	1.1
		G00306	123.3			
	B	G00307	123.5	247.4	251.4	4.0
		G00308	123.9			
	C - Post 1st Hour	G00309	124.0	247.1	249.6	2.5
		G00310	123.1			
	Amb	G00311	124.0	124.0	124.1	0.1
Probes	**A - 1st Hour**	19A	117024.1	117024.1	117024.2	0.1
	B	19B	117009.4	117009.4	117009.5	0.1
	C - Post 1st Hour	19C	114227.3	114227.3	114227.4	0.1
O-rings	**A - 1st Hour**	19A	3585.1	3585.1	3585.2	0.1
	B	19B	3632.4	3632.4	3632.4	0.0
	C - Post 1st Hour	19C	3615.1	3615.1	3615.2	0.1

Placed in Dessicator on:	2/18 - 16:00

Filters	**A - 1st Hour**	247.6	2/21 11:18	247.7	2/22 9:20				
	B	251.6	2/21 11:18	251.4	2/22 9:20				
	C - Post 1st Hour	249.6	2/21 11:18	249.6	2/22 9:20				
	Amb	124.1	2/21 11:18	124.1	2/22 9:20				
Probes	**A - 1st Hour**	117024.1	2/21 11:18	117024.2	2/22 9:20				
	B	117009.4	2/21 11:18	117009.5	2/22 9:21				
	C - Post 1st Hour	114227.4	2/21 11:18	114227.4	2/22 9:21				
O-Rings	**A - 1st Hour**	3585.1	2/21 11:18	3585.2	2/22 9:21				
	B	3632.5	2/21 11:18	3632.4	2/22 9:21				
	C - Post 1st Hour	3615.1	2/21 11:18	3615.2	2/22 9:21				

Train A Sub-total, mg	1.3
Train C Sub-Total, mg:	2.7
Train 1 Aggregate, mg:	**4.0**
Train 2 Aggregate, mg:	**4.1**
Ambient Aggregate, mg:	0.1

ASTM E2779 Wood Heater Run Sheets

Client: USSC | Job Number: 22-753 | Tracking #: 121
Model: 5522 | Run Number: 1 | Test Date: 2/18/2022

Pellet Heater Control Settings

High Burn Rate Settings: Heat Setting: #5 (Max setting) – Air Damper Fully Open
Medium Burn Rate Settings: Heat Setting: #3 (Min setting) – Air Damper Half Open
Low Burn Rate Settings: Heat Setting: #1 (Min setting) – Air Damper Fully Closed

Preburn Notes

Preburn Start Time: 8:35

Time	Notes
N/A	N/A

Test Notes

Test Burn Start Time: 9:35

Time	Notes
0 min	Started sampling, at high fire setting
60 min	Changed out 1st hr filter train, switched to the medium burn setting
180 min	Switched to low burn setting
360 min	End of Test

Test Burn End Time: 15:35

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 17.00 CO (%): 4.310
Mid Gas CO_2 (%): 10.09 CO (%): 2.530

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:55	8:58	8:57	15:43	15:45	15:44
CO_2	0.00	10.27	17.01	0.000	10.24	16.97
CO	0.000	2.559	4.312	0.000	2.554	4.301

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

Technician Signature: Date: 2/21/2022

ASTM E2515 - Glass Filters

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
G00289	123.5	123.5	—	—	SB	21-683	A1-2-500 EPA
G00290	122.9	123.0	—	—	SB	21-683	A2-6-750
G00291	123.8	123.7	—	—	SB	↓	↓
G00292	122.9	122.8	—	—	SB		
G00293	123.8	123.7	—	—	SB		
G00294	123.7	123.7	—	—	SB	21-683	A1-3-500
G00295	123.9	123.7	—	—	SB	↓	↓
G00296	122.9	122.8	—	—	SB		
G00297	123.5	123.3	—	—	SB		
G00298	124.1	124.1	—	—	SB	22-752	#1
G00299	123.0	122.9	—	—	SB		
G00300	123.2	123.1	—	—	SB		
G00301	123.9	123.9	—	—	SB		
G00302	123.8	123.8	—	—	SB		
G00303	123.1	123.1	—	—	SB		
G00304	122.7	122.6	—	—	SB		
G00305	123.3	123.3	—	—	SB	22-753	#1
G00306	123.3	123.3	—	—	SB		

Weight 1 Date/Time:
12/20 - 13:00
Weight 2 Date/Time:
12/21 - 5:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
G00307	123.7	123.5	-	-	SB		
G00308	123.9	123.9	-	-	SB		
G00309	124.0	124.0	-	-	SB		
G00310	123.3	123.1	-	-	SB		
G00311	124.0	124.0	-	-	SB		
G00312	122.8	122.7	-	-	SB		
G00313	122.2	122.2	-	-	SB		
G00314	123.4	123.2	-	-	SB		
G00315	122.9	122.8	-	-	SB		
G00316	123.5	123.4	-	-	SB		
G00317	123.4	123.4	-	-	SB		
G00318	123.7	123.8	-	-	SB		
G00319	122.8	122.7	-	-	SB		
G00320	123.4	123.4	-	-	SB		
G00321	123.3	123.2	-	-	SB		
G00322	123.6	123.6	-	-	SB		
G00323	~~124.~~ 123.3	123.5	-	-	SB		
G00324	123.0	123.1	-	-	SB		

Weight 1 Date/Time:
12/21 - 5:30
Weight 2 Date/Time:
1/3 - 10:00
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - Probe Samples 11-20

Date:	12/10/21	12/13/21	12/14/21				
Time:	12:00	10:00	8:00				
	Weight 1	**Weight 2**	**Weigth 3**	**Weight 4**	**Initial**	**Project**	**Run**
11A	116864.2	116864.5	116864.3	-	SB	21-683	A1-1-900 CFM
11B	117338.3	117338.9	117338.8	-	SB		
11C	116185.5	116186.0	116185.8	-	SB	21-683	A2-2-700 CFM
12A	116704.3	116705.4	116704	-	SB		
12B	117730.6	117771.4	117771.3	-	SB	21-683	A1-2-900 CFM
12C	117171.1	117171.8	117171.7	-	SB	21-683	A2-3-700 CFM
13A	117313.4	117314.3	117314.1	-	SB	21-683	A2-3-700 CFM
13B	116939.8	116940.7	116940.6	-	SB		
13C	115649.9	115651.8	115650.7	-	SB	21-683	A1-3-900 CFM
14A	~~117238.3~~	116633.1	116632.9	-	SB		
14B	~~116617.9~~	116618.2	116618.1	-	SB	21-683	A2-4-700
14C	~~116546.7~~	116530.5	116530.4	-	SB	21-683	A1-1-500
15A	117238.3	117239.1	117239.0	-	SB	21-683	A1-1-500
15B	116751.5	116751.9	116751.8	-	SB		
15C	116846.7	116847.6	116847.5	-	SB	21-683	A2-5-700

Date:	12/15/21	12/16/21	12/17/21	1/11/22			
Time:	8:30	8:30	8:00	8:30			
	Weight 1	**Weight 2**	**Weigth 3**	**Weight 4**	**Initial**	**Project**	**Run**
16A	116379.1	116378.5	116378.4	-	JB	21-683	A1-2-500
16B	115856.0	115859.2	115859.1	-	JB		
16C	114147.9	114147.8	-	-	JB	21-683	A2-6-700
17A	116809.5	116809.0	116808.9	-	JB	21-683	A2-6-700
17B	117139.4	117138.9	117138.9	-	JB		
17C	113140.4	113140.3	-	-	JB	21-683	A1-3-500
18A	-	117496.6	117495.9	117495.7	JB		
18B	-	117329.1	117328.2	117328.4	JB	22-752	#1
18C	-	114334.1	114333.4	114333.5	JB		
19A	-	117024.6	117024.0	117024.1	JB		
19B	-	117009.7	117009.2	117009.4	JB	22-753	#1
19C	-	~~114334.1~~ 114227.8	114227.1	114227.3	JB		
20A	-	115624.7	115623.9	115624.1	JB		
20B	-	115964.2	115963.7	115963.7	JB		
20C	-	113775.1	113773.6	113773.7	JB		

ASTM E2515 - O-Ring Samples 11-20

Date:	12/10/21	12/13/21	12/14/21	12/15/21			
Time:	11:00	10:00	8:00	8:30			
	Weight 1	**Weight 2**	**Weigth 3**	**Weight 4**	**Initial**	**Project**	**Run**
11A	3424.5	3425.0	3424.8	–	SB	21-683	A1-1-900 CFM
11B	4234.6	4234.7	–	–	SB		
11C	3589.9	3590.2	3590.0	–	SB	21-683	A2-2-700 CFM
12A	3587.0	3587.5	3587.3	–	SB		
12B	3551.4	3552.0	3551.8	–	SB	21-683	A1-2-900 CFM
12C	3618.5	3619.0	3618.8	–	SB	21-683	A2-3-700 CFM
13A	3597.5	3598.1	3597.9	–	SB	21-683	A2-3-700 CFM
13B	3644.1	3644.7	3644.2	3644.3	SB		
13C	4410.3	4410.7	4410.6	–	SB	21-683	A1-3-900 CFM
14A	3367.8	3367.8	3367.7	–	SB		
14B	3342.7	3342.8	3342.7	–	SB	21-683	A2-4-700
14C	3449.2	3449.5	3449.3	–	SB	21-683	A1-1-500
15A	3570.9	3571.4 3571.1	3571.1	–	SB	21-683	A1-1-500
15B	3571.6	3571.8	3571.8	–	SB		
15C	3398.6	3398.9	3398.7	–	SB	21-683	A2-5-700

Date:	12/15/21	12/16/21	1/16/22	1/11/22			
Time:	8:30	8:30	16:00	8:30			
	Weight 1	**Weight 2**	**Weigth 3**	**Weight 4**	**Initial**	**Project**	**Run**
16A	3573.5	3573.4	–	–	SB	21-683	A1-2-500
16B	3638.8	3638.7	–	–	SB		
16C	3602.4	3602.2	–	–	SB	21-683	A2-6-700
17A	3613.2	3613.0	–	–	SB	21-683	A2-6-700
17B	3569.6	3569.5	–	–	SB		
17C	3597.5	3597.3	–	–	SB	21-683	A1-3-500
18A	–	3603.1	3602.8	3607.0	SB		
18B	–	3546.5	3546.1	3546.3	SB	22-752	#1
18C	–	3529.1	3528.8	3529.0	SB		
19A	–	3585.3	3585.0	3585.1	SB		
19B	–	3632.5	3632.4	–	SB	22-753	#1
19C	–	3615.4	3615.1	3615.1	SB		
20A	–	3559.1	3558.8	3558.8	SB		
20B	–	3614.8	3614.3	3614.5	SB		
20C	–	3611.0	3610.6	3610.6	SB		

Appendix B

Owner's Instruction and Operation Manual

UNITED STATES STOVE CO.
ESTº 1869

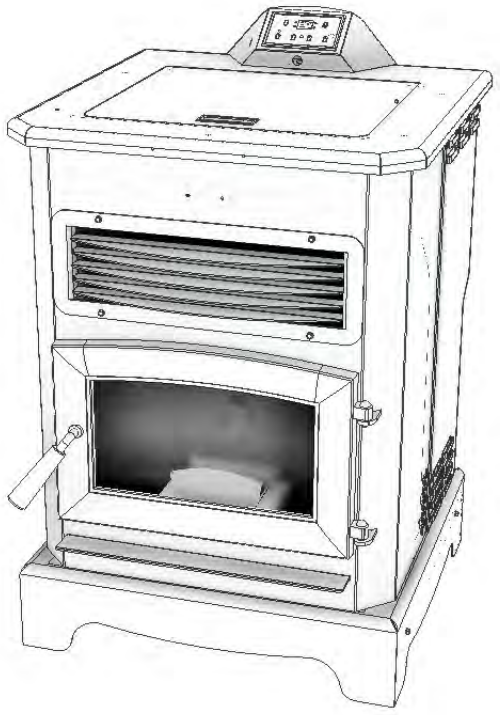
Model Number:

US5522

PFS® C US

Report Number: F20-570

Certified to ASTM E1509-12 (2017)
and ULC-S627-00-REV1
Mobile Home Approved



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

853929-1106L

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.

Owner's Instruction and Operation Manual

KING BY UNITED STATES STOVE CO

Model Number:

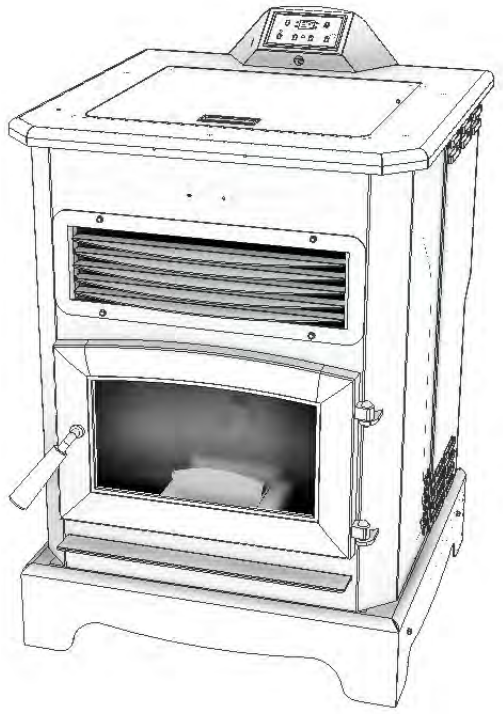
KP5522

PFS C US

Report Number: F20-570

Certified to ASTM E1509-12 (2017) and ULC-S627-00-REV1

Mobile Home Approved



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

853930-1004L

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.

INTRODUCTION

Your pellet stove has been safety tested and listed to ASTM E1509-12 (2017) and ULC-S627-00. This manual describes the installation and operation of the pellet stove. This heater meets the 2020 U.S. Environmental Protection Agency's crib wood emission limits for wood-heaters sold after May 15, 2020. Under specific EPA test conditions burning wood pellet fuel this heater has been shown to deliver heat at a rate of 32,591 to 13,640 Btu/hr. This heater achieved a particulate emissions rate of 1.5 g/hr when tested to method ASTM E 2779 / EPA Method 28R and 76% efficiency.

Heating Specifications		
Fuel Burn Rate* (lowest setting)	2.1-5 lbs/hr (0.97 - 2.26 kg/hr)	* Pellet size may effect the actual rate of fuel feed and burn times. Fuel feed rates may vary by as much as 20%. Use PFI listed fuel for best results.
Burn Time (lowest setting)	61 hrs.	
Hopper Capacity	130lbs. (59kg)	
Flue Size	3" or 4"	
Electrical Specifications		
Electrical Rating	110-120 Volts AC, 60 HZ, 3.0 Amps	
Watts (operational)	175 (approx.)	
Watts (igniter running)	425 (approx.)	
Dimensions		
Overall: Height x Width X Depth	40" (1003mm) X 24" (610mm) X 30" (762mm)	

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 online at www.usstove.com or download the free app today. This app is available only on the App Store for iPhone and iPad. Search US Stove. Save your receipt with your records for any claims.

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

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.
• THIS APPLIANCE IS A FREESTANDING HEATER. IT IS NOT INTENDED TO BE ATTACHED TO ANY TYPE OF DUCTING. IT IS NOT A FURNACE. DO NOT CONNECT THIS UNIT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM. THIS APPLIANCE IS NOT INTENDED FOR COMMERCIAL USE.
• INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.
• DO NOT INSTALL A FLUE DAMPER IN THE EXHAUST VENTING SYSTEM OF THIS UNIT.
• YOUR STOVE REQUIRES PERIODIC MAINTENANCE AND CLEANING (SEE "MAINTENANCE"). FAILURE TO MAINTAIN YOUR STOVE MAY LEAD TO IMPROPER AND/OR UNSAFE OPERATION.
• A POWER SURGE PROTECTOR IS REQUIRED. THIS UNIT MUST BE PLUGGED INTO A 110 - 120V, 60 HZ GROUNDED ELECTRICAL OUTLET. DO NOT USE AN ADAPTER PLUG OR SEVER THE GROUNDING PLUG. DO NOT ROUTE THE ELECTRICAL CORD UNDERNEATH, IN FRONT OF, OR OVER THE HEATER. DO NOT ROUTE THE CORD IN FOOT TRAFFIC AREAS OR PINCH THE CORD UNDER FURNITURE.

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

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

CAUTION:
• USE OF OUTSIDE AIR IS NOT REQUIRED FOR THIS UNIT.
• 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.
• NEVER BLOCK FREE AIRFLOW THROUGH THE OPEN VENTS OF THE UNIT.

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

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

https://nficertified.org,

https://www.wettinc.ca/

INSTALLATION OPTIONS

Freestanding Unit - supported by pedestal/legs and placed on a non-combustible floor surface in compliance with clearance requirements for a freestanding stove installation.

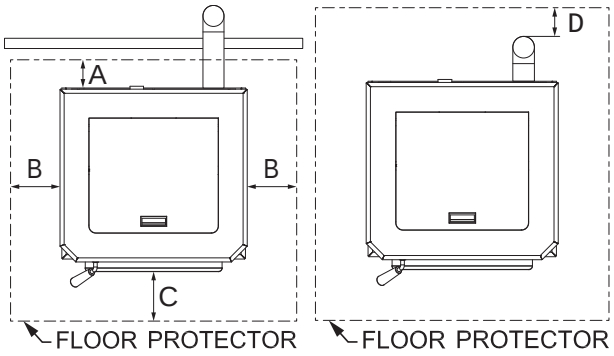
Alcove Unit - supported by pedestal/legs and placed on a non-combustible floor surface in compliance with clearance requirements for an alcove installation.

IMPROPER INSTALLATION

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

FLOOR PROTECTION

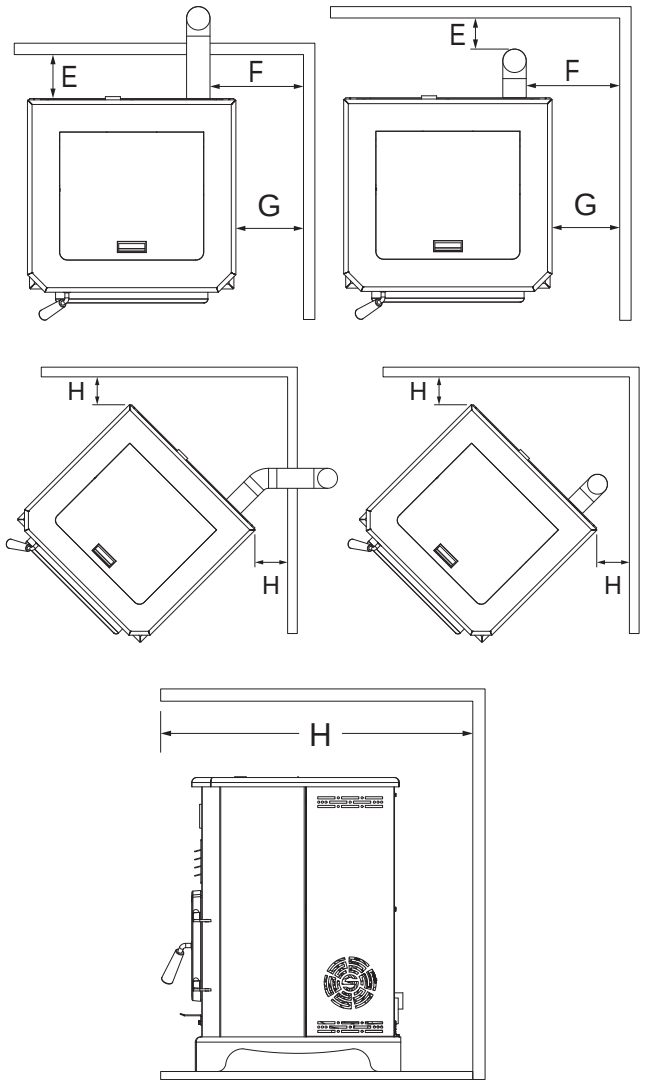
This unit must be installed on a non-combustible floor surface. If a floor pad is used, it should be certified or equal. The floor pad or non-combustible surface should be large enough to extend a minimum of 6" (153 mm) in front, 6" (153 mm) on each side, and 1" (26 mm) behind the stove. Floor protection must extend under and 2" (51 mm) to each side of the chimney tee for an interior vertical installation. A Floor Protector of 1" (26 mm) thick is recommended for this installation. Canadian installations require 18" (450 mm) in front of the unit.



A	Rear (through wall)	1"	25 mm
B	Side	6"	152 mm
C	Front	*6"	*152 mm
D	Rear (interior vertical)	2"	50 mm
* Canada installation requires 18" (450 mm) in front of the unit.			

CLEARANCES

Your pellet stove has been tested and listed for installation in residential, mobile home, and alcove applications in accordance with the clearances given in this manual. NOTE: The distance on the side of your pellet stove may need to be greater than the minimum required clearance for suitable access to the control panel. For safety reasons, please adhere to the installation clearances and restrictions. Any reduction in clearance to combustibles may only be done by means approved by a regulatory authority.



PARALLEL	E	Backwall to unit	2"	50 mm
	F	Sidewall to flue	13"	330 mm
	G	Sidewall to top edge of unit	8"	203 mm
CORNER	H	Adjacent wall to unit	8"	203 mm
ALCOVE	J	Alcove depth	36"	914 mm

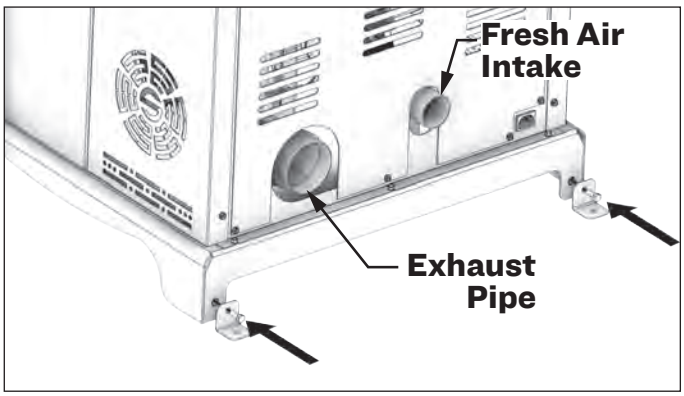
OUTSIDE AIR SUPPLY (OPTIONAL, UNLESS INSTALLING IN A MOBILE HOME)

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.

SECURING APPLIANCE TO THE FLOOR

Use the designated holes to secure the unit to the floor.



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

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

- This stove must be securely fastened to the floor of the mobile home using two 1/4" lag bolts that are long enough to go through both a hearth pad, if used, and the floor of the home.
- The heater must be electrically grounded to the steel chassis of the mobile home with 8 GA copper wire using a serrated or star washer to penetrate paint or protective coating to ensure grounding.
- 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.

VENTING REQUIREMENTS

WARNING:
• **INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.**
• **DO NOT CONNECT THE PELLET VENT TO A VENT SERVING ANY OTHER APPLIANCE OR STOVE.**
• **DO NOT INSTALL A FLUE DAMPER IN THE EXHAUST VENTING SYSTEM OF THIS UNIT.**

The following installation guidelines must be followed to ensure conformity with both the safety listing of this stove and to local building codes. Do not use makeshift methods or compromise in the installation.

IMPORTANT:
THIS UNIT IS EQUIPPED WITH A NEGATIVE DRAFT SYSTEM THAT PULLS AIR THROUGH THE BURN POT AND PUSHES THE EXHAUST OUT OF THE DWELLING. IF THIS UNIT IS CONNECTED TO A FLUE SYSTEM OTHER THAN THE WAY EXPLAINED IN THIS MANUAL, IT WILL NOT FUNCTION PROPERLY.

MAXIMUM VENTING DISTANCE

Installation MUST include at least 3-feet of vertical pipe outside the home. This will create some natural draft to reduce the possibility of smoke or odor during appliance shutdown and keep exhaust from causing a nuisance or hazard by exposing people or shrubs to high temperatures. The maximum recommend vertical venting height is 12-feet for 3-inch type "PL" vent. Total length of horizontal

vent must not exceed 4-feet. This could cause back pressure. Use no more than 180 degrees of elbows (two 90-degree elbows, or two 45-degree and one 90-degree elbow, etc.) to maintain adequate draft.

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 neighbours or in a valley which may cause unhealthy or nuisance conditions.

PELLET VENT TYPE

A certified 3-inch or 4-inch type "PL" pellet vent exhaust system must be used for installation and attached to the pipe connector provided on the back of the stove (use a 3-inch to 4-inch adapter for 4-inch pipe). The connection at the back of the stove must be sealed using Hi-Temp RTV. Use a 4-inch vent if the vent height is over 12-feet or if the installation is over 2,500 feet above sea level. We recommend the use of Simpson Dura-Vent® or Metal-Fab® pipe (if you use other pipes, consult your local building codes and/or building inspectors). Do not use Type-B Gas Vent pipe or galvanized pipe with this unit. The pellet vent pipe is designed to disassemble for cleaning and should be checked several times during the burning season. The pellet vent pipe is not furnished with the unit and must be purchased separately.

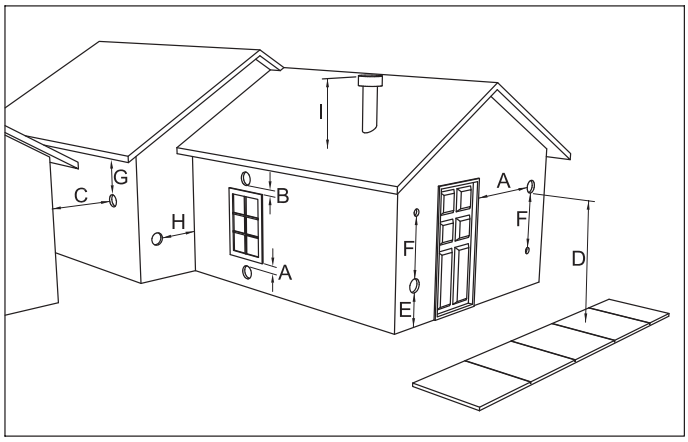
PELLET VENT INSTALLATION

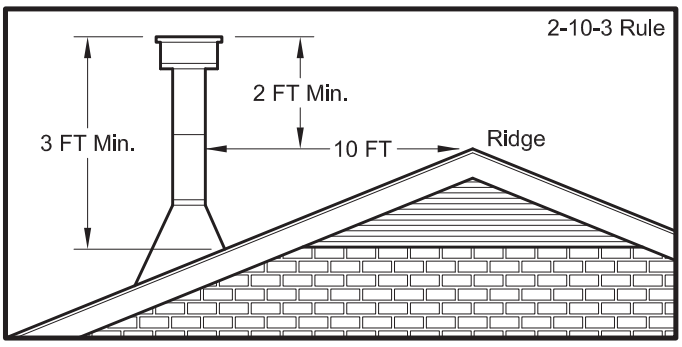
The installation must include a clean-out tee to enable collection of fly ash and to permit periodic cleaning of the exhaust system. 90-degree elbows accumulate fly ash and soot thereby reducing exhaust flow and performance of the stove. Each elbow or tee reduces draft potential by 30% to 50%. All joints in the vent system must be fastened by at least 3 screws, and all joints must be sealed with Hi-Temp RTV silicone sealant 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. Vent surfaces can get hot enough to cause burns if touched by children. Noncombustible shielding or guards may be required.

PELLET VENT TERMINATION

Do not terminate the vent in an enclosed or semi-enclosed area, such as; carport, garage, attic, crawl space, under a sun deck or porch, narrow walkway, or any other location that can build up a concentration of fumes. Termination in one of these areas can also lead to unpredictable pressure situations with the appliance, and could result in improper performance and/or malfunction. The termination must exhaust above the outside air inlet elevation. The termination must not be located where it will become plugged by snow or other materials. Do not terminate the venting into an existing steel or masonry chimney.

VENT TERMINATION CLEARANCES





A. Minimum 4-foot (1.22m) clearance below or beside any door or window that opens.

B. Minimum 1-foot (0.3m) clearance above any door or window that opens.

C. Minimum 3-foot (0.91m) clearance from any adjacent building.

D. Minimum 7-foot (2.13m) clearance from any grade when adjacent to public walkways.

E. Minimum 2-foot (0.61m) clearance above any grass, plants, or other combustible materials.

F. Minimum 3-foot (0.91m) clearance from an forced air intake of any appliance.

G. Minimum 2-foot (0.61m) clearance below eves or overhang.

H. Minimum 1-foot (0.3m) clearance horizontally from combustible wall.

I. Must be a minimum of 3 foot (0.91m) above the roof and 2 foot (0.61m) above the highest point or the roof within 10 feet (3.05m).

Determining where to install your new pellet stove heater. To get the most efficient use of re-circulated heat, you should consider a room that is centrally located within your home. Choose a room that is large and open. It is Extremely Important to maintain proper clearances from any combustible surfaces or materials in the room where your heater will be located. You can find proper clearance measurements in this manual and on the rating label of your pellet stove. The pellet stove can be vented through an exterior wall or into an existing masonry or metal chimney if "PL" vent pipe is used throughout existing chimney. Venting can pass through the ceiling and roof if approved pipe is used. Where passage through a wall, or partition of combustible construction is desired, the installation must conform to CAN/CSA-B365.

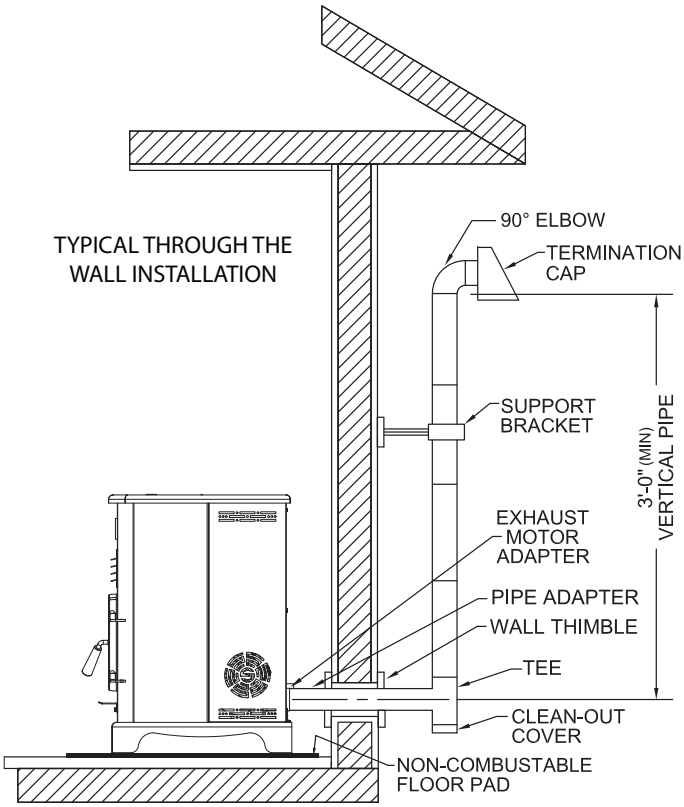
WARNING:
• **DO NOT OBTAIN COMBUSTION AIR FROM THE ATTIC, GARAGE OR ANY OTHER UNVENTILATED AREA. YOU MAY OBTAIN COMBUSTION AIR FROM A VENTILATED CRAWL SPACE.**
• **DO NOT INSTALL A FLUE DAMPER IN THE EXHAUST VENTING SYSTEM OF THIS UNIT.**
• **DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER HEATER, FURNACE OR APPLIANCE.**
• **INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.**
• **ONLY USE APPROVED MATERIAL FOR INSTALLATION, FAILURE TO DO SO MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY, OR EVEN DEATH.**

This appliance is certified for use with listed 3 inch or 4 inch "PL" pellet venting products. The use of other components other than stated herein could cause bodily harm, heater damage, and void your warranty.

HORIZONTAL EXHAUST VENT INSTALLATION

1. Locate your pellet stove in a location which meets the requirements of this manual, but in an area where it does not interfere with the house framing, wiring, etc.
2. Install a non-combustible hearth pad underneath the pellet stove. This pad should extend at least 6" (152 mm) in front of the unit.
3. Place the pellet stove approximately 15" (381 mm) away from the interior wall.
4. Locate the center of the exhaust pipe of your unit. This point should then be extended to the interior wall of your house. Once you have located the center point, on the interior wall, cut a 7" (175 mm) diameter hole through the wall.
5. The next step is to install the wall thimble, refer to the instructions which come with the wall thimble for this step.
6. Install the appropriate length of exhaust vent pipe into the wall thimble. See steps 11 and 12 when determining the correct length of exhaust vent to use.
7. **Outside Fresh Air is Mandatory when installing this pellet stove room heater in airtight homes and mobile homes. Be sure that the outside air vent has an approved cap on it to prevent rodents from entering. Be sure to install in location that won't become blocked with snow, etc.**
8. Connect the exhaust vent pipe to the exhaust outlet of your pellet stove.
9. Secure all vent joint connections with 3 screws. Seal the exhaust vent joint connections with high temperature silicone sealant.
10. Push the unit straight back to the interior wall, being sure to maintain the minimum clearances to combustibles 2" (51 mm) to the back of the unit. Seal the annular space of the wall thimble and around the vent pipe with high temperature silicone sealant.
11. The exhaust vent pipe must extend at least 12" (300 mm) out past the exterior wall. Seal the annular space of the wall thimble and around the vent pipe with high temperature silicone sealant.
12. Install an approved horizontal termination cap or if necessary install a 90° elbow and appropriate length of vertical venting. An approved vertical vent cap is recommended.

THROUGH THE WALL INSTALLATION (RECOMMENDED INSTALLATION)



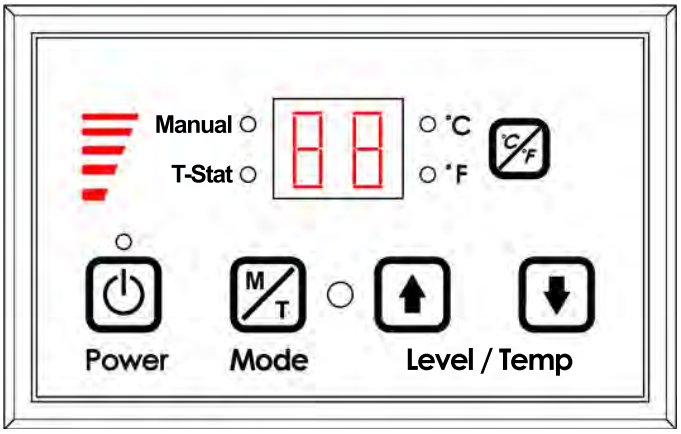
Canadian installations must conform to CAN/CSA-B365. To vent the unit through the wall, connect the pipe adapter to the exhaust motor adapter. If the exhaust adapter is at least 18" (457 mm) above ground level, a straight section of pellet vent pipe can be used through the wall. Your heater dealer should be able to provide you with a kit that will handle most of this installation, which will include a wall thimble that will allow the proper clearance through a combustible wall. Once outside the structure, a 3" (76 mm) clearance should be maintained from the outside wall and a clean out tee should be placed on the pipe with a 90-degree turn away from the house. At this point, a 3ft (0.91m) (minimum) section of pipe should be added with a horizontal cap, which would complete the installation. A support bracket should be placed just below the termination cap or one every 4ft (1.22m) to make the system more stable. If you live in an area that has heavy snowfall, it is recommended that the installation be taller than 3ft (0.91m) to get above the snowdrift line. This same installation can be used if your heater is below ground level by simply adding the clean-out section and vertical pipe inside until ground level is reached. With this installation you have to be aware of the snowdrift line, dead grass, and leaves. We recommend a 3ft (0.91m) minimum vertical rise on the inside or outside of the house. The "through the wall" installation is the least expensive and simplest installation. Never terminate the end vent under a deck, in an alcove, under a window, or between two windows. We recommend Simpson Dura-Vent® or Metal-Fab® kits.

THROUGH THE ROOF/CEILING INSTALLATION

- When venting the heater through the ceiling, the pipe is connected the same as through the wall, except the clean-out tee is always on the inside of the house, and a 3" (76 mm) adapter is added before the clean-out tee.
- You must use the proper ceiling support flanges and roof flashing (supplied by the pipe manufacturer; follow the pipe manufacturer's directions). It is important to note that if your vertical run of pipe is more than 12ft (3.7m), the pellet vent pipe size should be increased to 4" (102 mm) in diameter.
- Do not exceed more than 4ft (1.22m) of pipe on a horizontal run and use as few elbows as possible. If an offset is required, it is better to install 45-degree elbows rather than 90-degree elbows.

NEVER OPERATE THIS PRODUCT WHILE UNATTENDED

HOW YOUR STOVE WORKS



Your pellet stove utilizes a inclined auger fuel feed system that is operated by a microprocessor controlled digital circuit board. The digital circuit board allows the inclined auger fuel feed system to run in a timer-based, non-continuous cycle; this cycling allows the auger to run for a predetermined period of seconds. The auger pushes pellets up a chute located at the front/bottom of the hopper which in turn falls through another chute into the burnpot. Your stove is equipped with an automatic ignition system that should ignite the fuel within 5-10 minutes from pressing the ON button. As pellets enter the burn pot and ignite, outside air is drawn across the fuel and heated during the combustion process which is then pulled through the heat exchanger by the exhaust motor or draft fan. As the stove heats up, room air is circulated around the heat exchanger by means of a room air blower, distributing warm air into the room.

The amount of heat produced by the stove is proportional to the rate of the fuel that is burned, and this rate is controlled by the "HEAT RANGE" setting. In order to maintain combustion of the fuel at a desired rate, the air provided to the burn chamber by the exhaust or draft fan must be maintained precisely. Too little air will result in a flame that is non-energetic or lazy. If the fuel continues to flow with too little air for long enough, the burn pot will fill with too much fuel and the fire will smother out. To much air will result in a flame that is overactive or aggressive. The flame in this situation is typically very blue at the bottom and resembles a blow torch. If this situation continues, the fuel in the burn pot will be consumed and the fire will go out. Matching the amount of air required for proper combustion to the fuel rate is the primary objective in effectively burning pellets of various brands and qualities in your stove. The air to fuel ratio can be adjusted to allow almost any fuel quality to burn effectively by following the procedures detailed in the remainder of this manual. Because a forced draft pressure is required for the combustion process inside your stove, it is extremely important that the exhaust system be properly installed and maintained. And, that when operating your stove, you make sure that the viewing door is properly sealed.

PANEL/REMOTE CONTROLS

The operation of this appliance can be controlled from the panel located on the side of the stove and/or by the remote control. The control functions are as follows:

A. **On/Off Switch ("Power" Button)**

- When pushed, the stove will automatically ignite. No other fire starter is necessary. The igniter will stay on for at least 10 and up to 12 minutes, depending on when Proof of Fire is reached. The fire should start in approximately 5 minutes.
- After pushing "POWER", the auger motor is on for 3.5 minutes, off for 1 minute. During the remainder of the start-up period, the auger motor operates on the heat range "1" setting.
- During start up the heat level advance (Up and Down keys) will change the heat range indicator level accordingly, but there is no change in the stoves operating conditions until start-up is completed.
- During start-up ignition must occur within 12 minutes or the stove will error out and show E3.
- During the start-up phase, the Mode key does not function.

B. **Heat Range Arrow Buttons**

- These buttons when pushed will set the pellet feed rate, hence the heat output or heat range of your stove. When using the hand-held remote this function can be performed with the “Up/Down” buttons.
- The levels of heat output will incrementally change on the bar graph starting from heat range “1” to heat range “5”.

CONTROL PANEL OVERVIEW

Turning the heater ON/OFF, 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 which is located on the lower left-hand side of your heater.

- **ON/OFF**

Pressing the “ON” button on the control panel will begin the start-up sequence for the heater. Fuel will begin to feed through the auger feed system then ignite after approximately 5 minutes.

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.

- **HEAT RANGE**

Pressing the “Heat Range” arrows, up or down, will adjust the amount of fuel being delivered to the burnpot.

- **DRAFT FAN**

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 the heater is in the manual mode, the optional thermostat will not properly control the unit. When adjusting the Draft Fan setting, try only 1 setting above or below the heat setting. It is better to leave the stove in the automatic mode.

- **ROOM FAN**

The room fan will come on once the unit has reached operating temperature. 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 room fan must operate at a level greater than or equal to the heat range setting.

- **AUX - USED TO RETURN THE STOVE TO THE FACTORY SETTINGS**

To return the stove to it’s original factory settings, press and hold the AUX UP and AUX DOWN buttons simultaneously for 3 seconds.

- **AUGER DELAY**

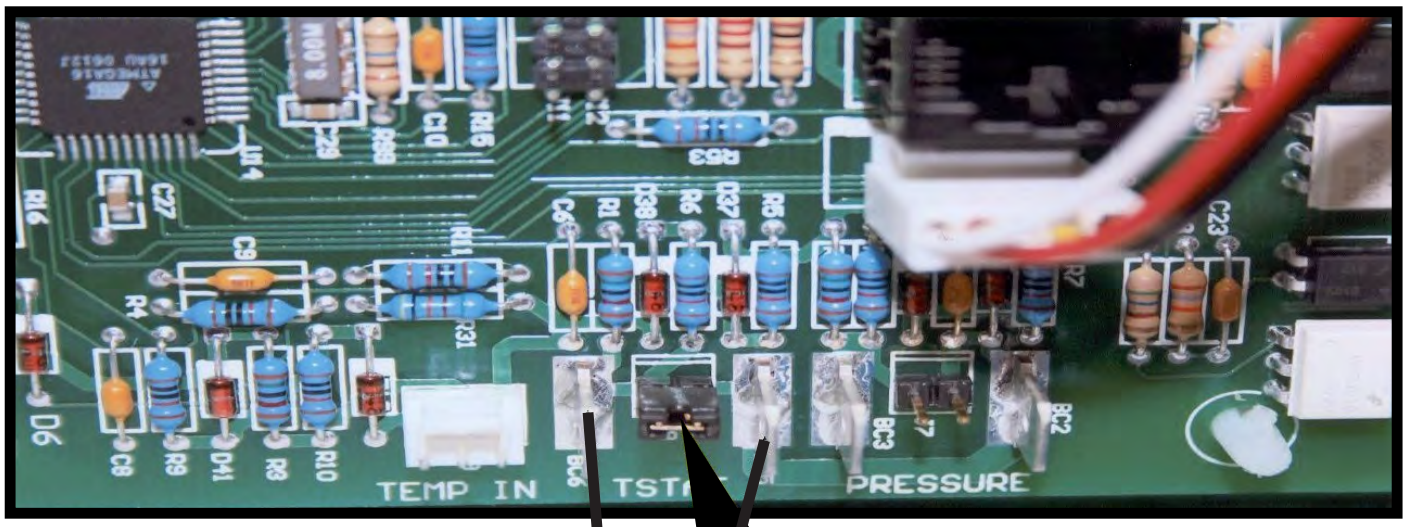
The “Auger Delay” button can be used to pause rotation of the Auger for approximately 1 minute. This can be cancelled by pressing the “ON” button. The “Auger Delay” is normally used only during the start up cycle to slow the fuel delivery down during the initial ignition.

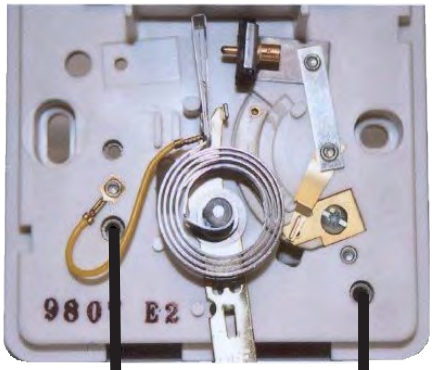
- **MODE**

The “Mode” button is not used on this model.

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.

THERMOSTAT HOOK-UP





The Jumper Must Be Removed First

1. Put female terminals on the lead wires to your low voltage thermostat.
2. Plug one thermostat lead onto each of the terminal posts on the circuit board.

IMPORTANT NOTE: The purpose of the T'Stat is to make the stove cycle between the preselected desired heat range setting ("1" to "5") and the minimum heat range setting of "1". ***The T'Stat will not turn the stove on and off.***

When the desired room temperature has been reached and the T'Stat no longer requires heat it will reduce to a minimum heat range setting of "1". ***The unit will not turn completely off.*** Once the room temperature has dropped and the T'Stat requires more heat, the unit will begin to feed pellets at the preselected heat setting ranging from "1" to "5".

Use 18 gauge, 2 conductor wire

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.**

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

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

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

PROPER FUEL

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

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

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

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

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

PRE-START-UP CHECK

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

BUILDING A FIRE

Never use a grate or other means of supporting the fuel. Use only the 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 pellet 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 open. To achieve a “medium burn” your stove should be set on setting 3 with the damper 50% open. To achieve a “low burn” your stove should be set on setting 1with the damper closed. 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

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

If the fire doesn’t start in 12 minutes, press “On/Off”, wait a few minutes, clear the burn pot, and start the procedure again.

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.

ROOM AIR FAN

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

IF STOVE RUNS OUT OF PELLETS

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

REFUELLING

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

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

TAMPER WARNING

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

SHUTDOWN PROCEDURE

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

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

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

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

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

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

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

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

INTERIOR CHAMBERS

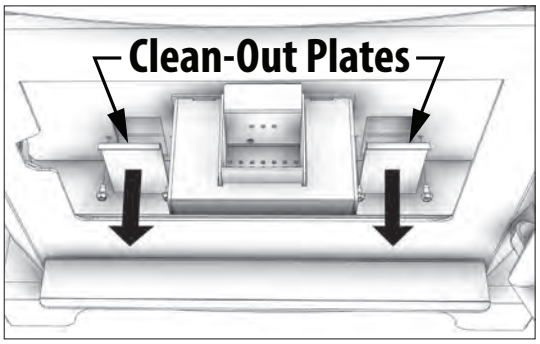
- **Burn Pot -** Periodically remove and clean the burn pot and the area inside the burn pot housing. In particular, it is advisable to clean out the holes in the burn pot to remove any build up that may prevent air from moving through the burn pot freely.
- **Heat Exchanger -** There are two clean out plates that need to be removed in order to clean the fly ash out of the heat exchanger. Open the door to access the cleanouts located inside the firebox, one on each side of the burnpot. The clean outs are secured to the firebox with (2) 5/16" screws each. Remove the clean outs and vacuum out any accumulated ash. This should be done at least once per month or more frequently if large amounts of ash are noticed while cleaning or if the stove does not seem to be burning properly.

Over time ash or dust may accumulate on the blades of the circulation & exhaust fans. The fans should be inspected, periodically, and if any accumulation is present vacuumed clean as the ash or dust can impede the fans performance. It is also possible that creosote may accumulate in the exhaust fan therefore, this must be brushed clean. The exhaust fan can be found behind the left side panel (facing the front of the heater), the circulation fan can be found behind the right side panel. To access the igniter, remove the air inlet tube and cover (2 screws). The auger motor is located in the center rear of the unit. Note: When cleaning, take care not to damage the fan blades.

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

DO NOT VACUUM HOT ASH.

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



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 3/4" 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 eight nuts 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

- 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.
- Never try to repair or replace any part of the stove unless instructions for doing so are given in this manual. All other work should be done by a trained technician.

PROBLEM	CAUSE: To rich air/fuel mixture
Orange, lazy flame excessive fuel build-up in the burnpot	Clean out the burnpot and burnpot housing Make sure that the viewing door is closed and sealed properly. If not, adjust door catch and/or replace door gaskets. Check that all outside connections are clear of any obstructions. Check the exhaust system; clean as needed.
PROBLEM	CAUSE: Burnpot burns out of fuel
Fire goes out or stove shuts down.	Hopper is empty, refill the hopper. Loss of draft pressure. Make sure that the viewing door is closed and sealed properly. If not, adjust door catch and/or replace door gaskets. Check that all outside connections are clear of any obstructions. Check the exhaust system; clean as needed. Check that the pressure switch connection to the firebox is free of ash or clear of obstructions. Auger system is jammed or there is a “bridging” of the fuel in the hopper, preventing fuel from flowing into the auger feed system.
PROBLEM	CAUSE: Auto-Start Igniter fails to ignite the fuel in the burn pot.
Stove does not start a fire when the “ON” button is pushed	Turn the stove “OFF”. Clear the unburned fuel from the burnpot and try again. Check the pellet quality. Replace if moist, wet, or dirty. Loss of draft pressure. Make sure that the viewing door is closed and sealed properly. If not, adjust door catch and/or replace door gaskets. Check that all outside connections are clear of any obstructions. Check the exhaust system; clean as needed. Check that the auto-start igniter is not blocked with ash or soot. (The igniter is located behind the burnpot on the back wall of the firebox.) Check that the pressure switch connection to the firebox is free of ash or clear of obstructions. The auto-start igniter gets “red hot” during start-up. If you can not visibly see the igniter glowing during start-up, then the igniter may need to be replaced or there is a problem with the electrical control system.
PROBLEM	CAUSE: Power outage
Experiencing low exhaust pressure	Turn off the circuit board and turn it back on.

ATTENTION: 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.

Error Code	Error Description	Possible Causes
Err1	The high limit temperature sensor has tripped.	Inadequate ventilation. Room fan failure. Exhaust Blockage. Electrical Open in wiring.
Err2	Stove ran out of fuel during normal operation.	Hopper Empty. Auger output failure or jam. Flame of fuel quality caused fire to burn too slowly or go out. Electrical Open in wiring. The high limit thermosdisc has tripped and will need to be manually reset.
Err3	The stove was unable to reach the Room Fan On temperature within the start-up time.	Flame or Fuel quality caused the fire to burn too slowly or go out. Auger output failure or jam Hopper empty on start-up.
Err4	The power failed while the stove was hot, and when power was restored, the fire was out.	Electrical Open in wiring. Power loss
Err5	The Auger output fuse has blown.	Auger motor jammed or bad.
Err6	The Ignitor output fuse has blown.	Ignitor shorted out 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.

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 stove is in the “Start Up” state waiting for the ignition procedure to complete.

Flashing Off Indicator - This indicates that the stove is in the “Shut Down” state waiting for the off button, or for a 15 minute period after the stove was turned off, or for the stove to cool down, or for the door to be closed.

Flashing dash in Heat Range Display - This indicates that the stove 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 Automatic Mode Indicator - This indicates that the stove is in normal operation and is running in the automatic mode. However, either the draft fan or room fan setting is manually configured.

Flashing Draft Fan Setting Indicator - This indicates that the stove 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 ignitor is on during the lighting stage.

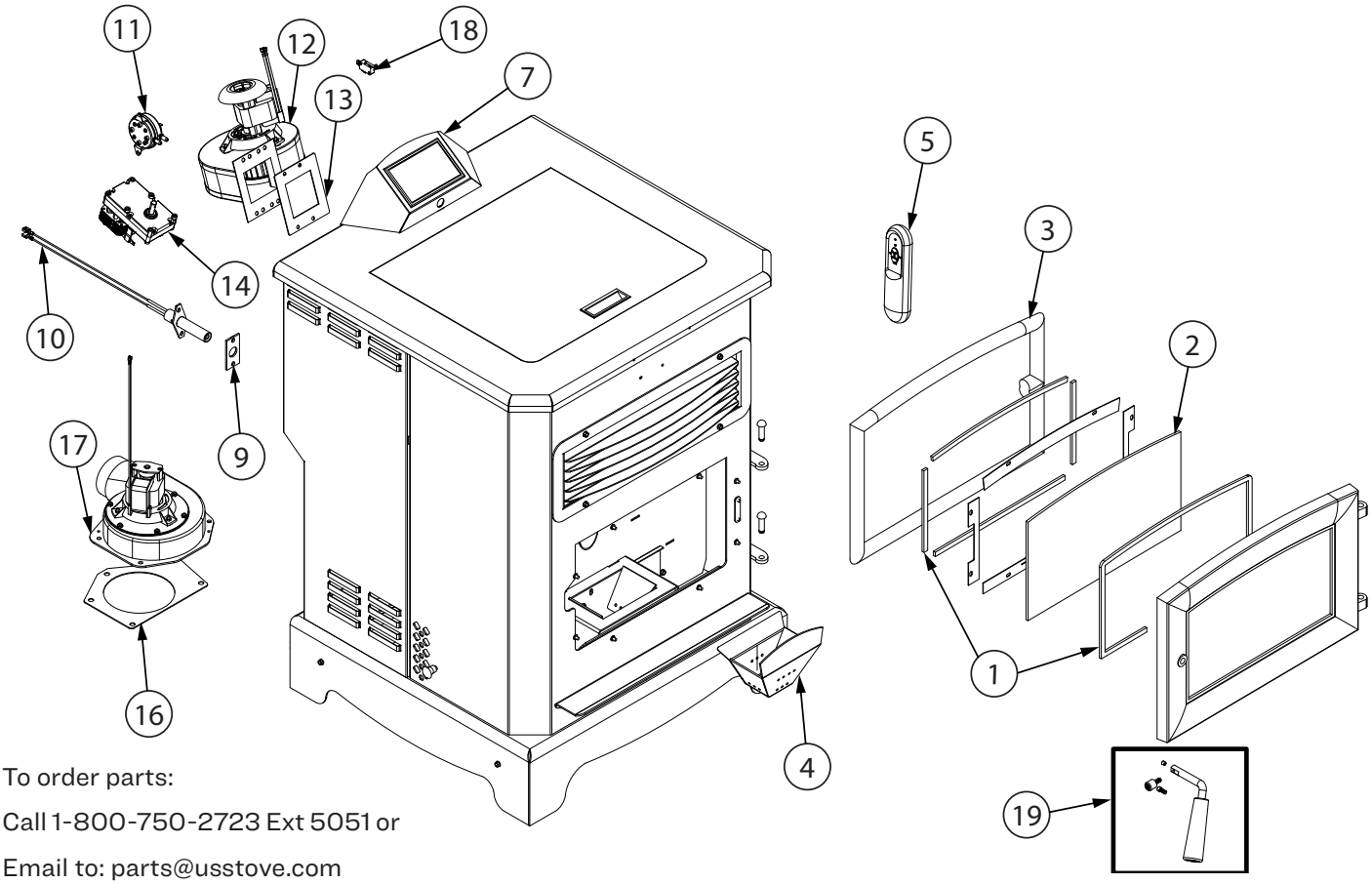
Quickly (changes twice per second) Flashing Heat Range Setting Indicator - This indicates that the stove is in normal operation and that an over-temperature condition exists causing the fuel to stop.

Slowly (changes once per second) Flashing Heat Range Setting Indicator - This indicates that the stove is in a cut back condition in an attempt to prevent an over-temperature shut down.

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.

NOTE: NUMBERS 6, 8, &15 ARE NOT YET SHOWN



To order parts:

Call 1-800-750-2723 Ext 5051 or

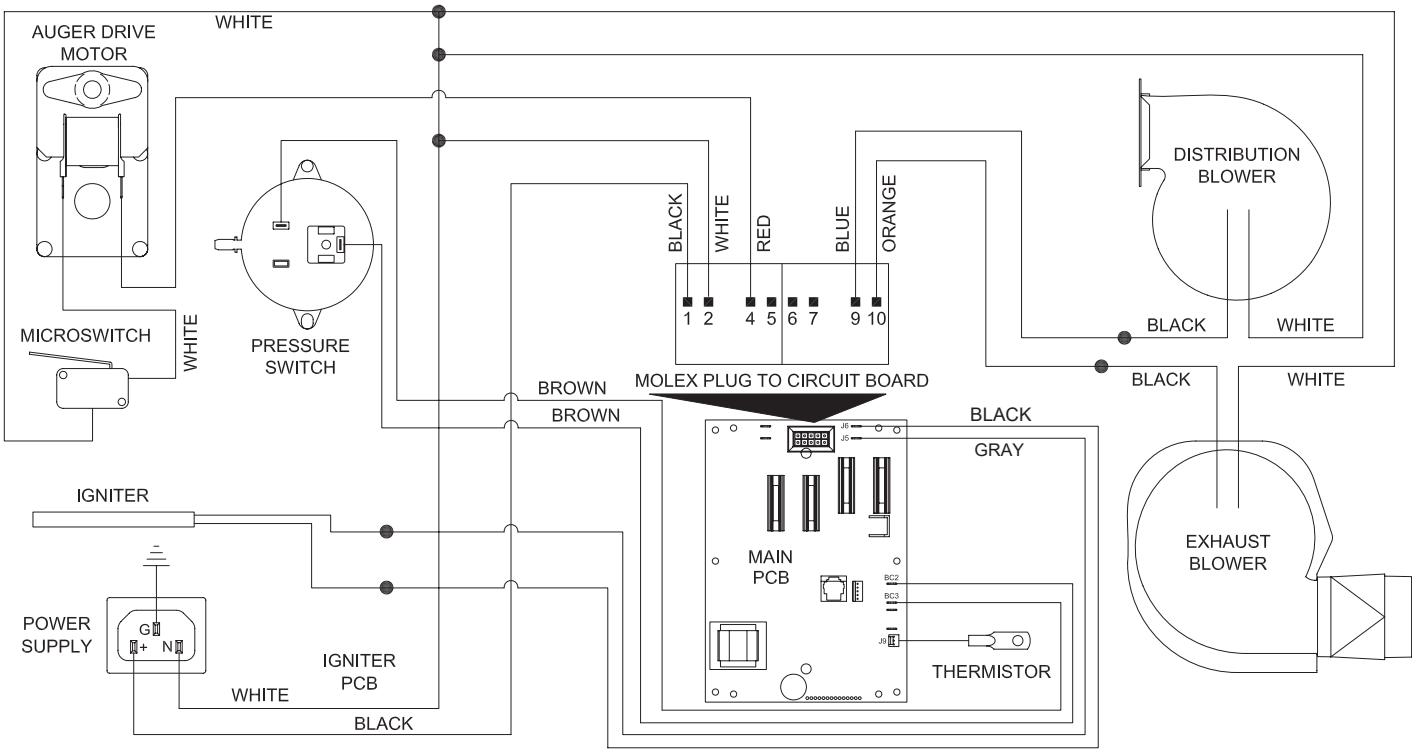
Email to: parts@usstove.com

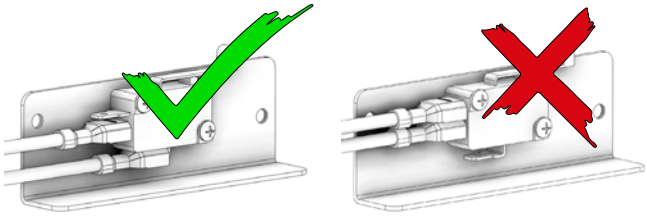
Key	Part #	Description	Qty
1	88174	Glass Gasket - Flat (3/16T x 3/8W)	1
2	893159	Clear Glass	1
3	88324	1” Rope Gasket	1
4	69762	Burnpot Assembly	1
5	80780	IR Remote	1
6		Burnpot Housing Gasket	1
7	80778	Circuit Board Assy.	1
8		Exhaust Duct Gasket	1
9	88118	Ignitor Flange Gasket	1

10	80869	Ceramic Ignitor	1
11	80549	Pressure Switch	1
12	80472	Distribution Blower	1
13	88106	Distribution Blower Gasket	1
14	80488	Drive Motor (1.5 RPM CCW)	1
15		Snapdisc	1
16	88100	Exhaust Blower Gasket	1
17	80473	Exhaust Blower	1
18	80491	Microswitch	1
19	893241-US	Door Handle Kit	

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.

WIRING DIAGRAM





CORRECT **WRONG**

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

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	

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

NOTES

ENREGISTREMENT DE SERVICE

Il est recommandé que votre système de chauffage est desservi régulièrement et que le Service Interval enregistrement approprié est terminée.

FOURNISSEUR DE SERVICES

Avant de terminer l'enregistrement de service approprié ci-dessous, s'il vous plaît vous assurer que vous avez effectué le service tel que décrit dans le les instructions du fabricant. Toujours utiliser pièce de rechange indiquée par le fabricant lors de remplacement est nécessaire.

Service de 01 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 02 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 03 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

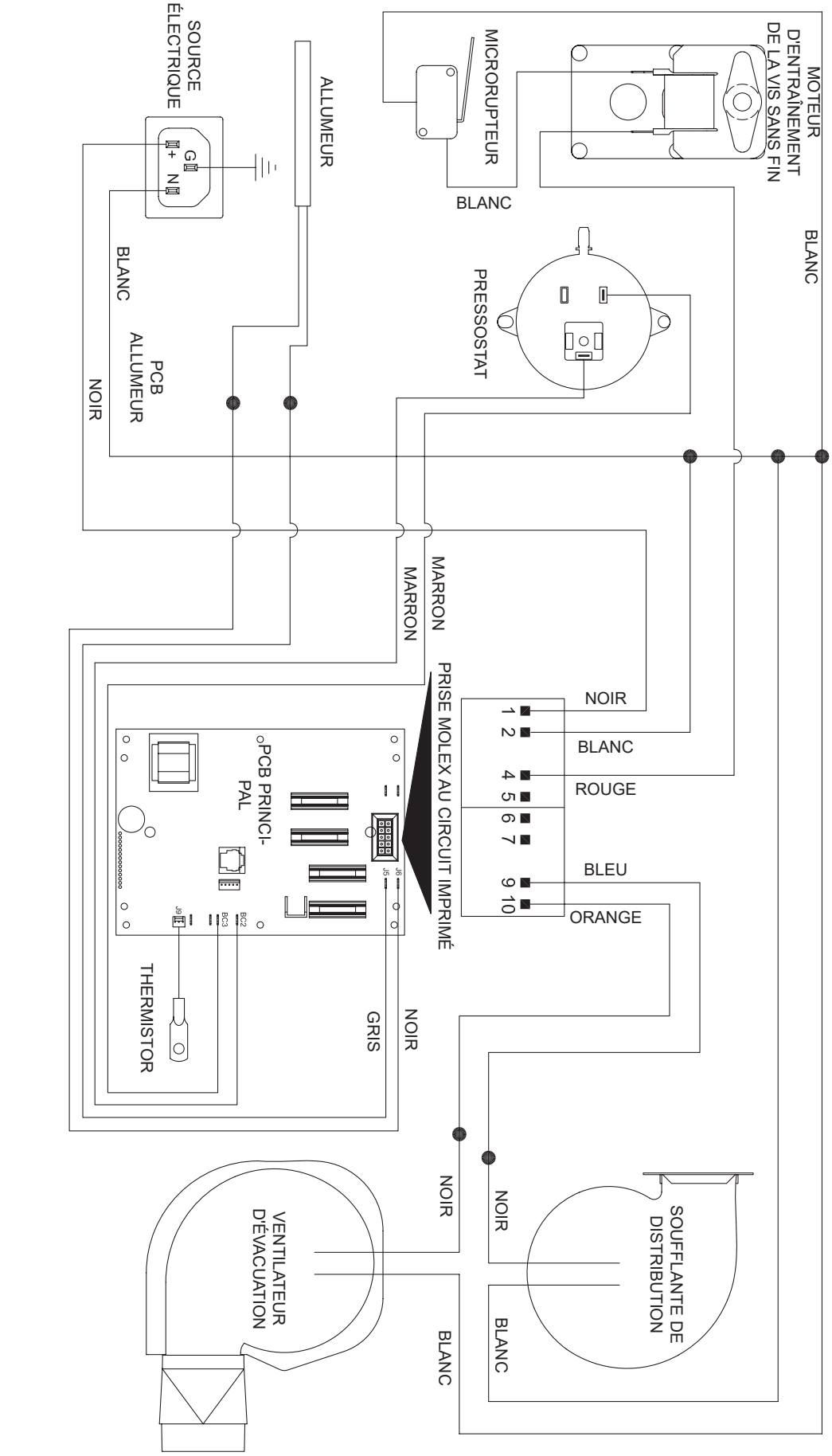
Service de 04 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

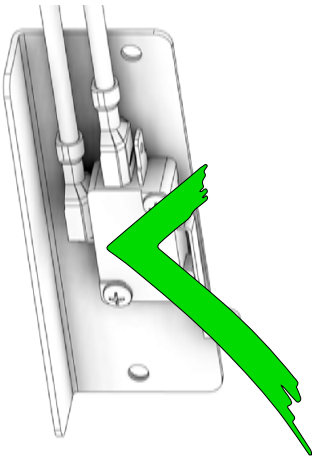
Service de 05 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 06 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

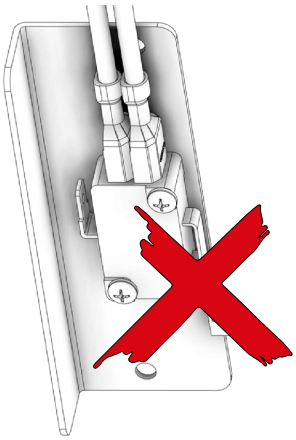
Service de 07 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 08 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____



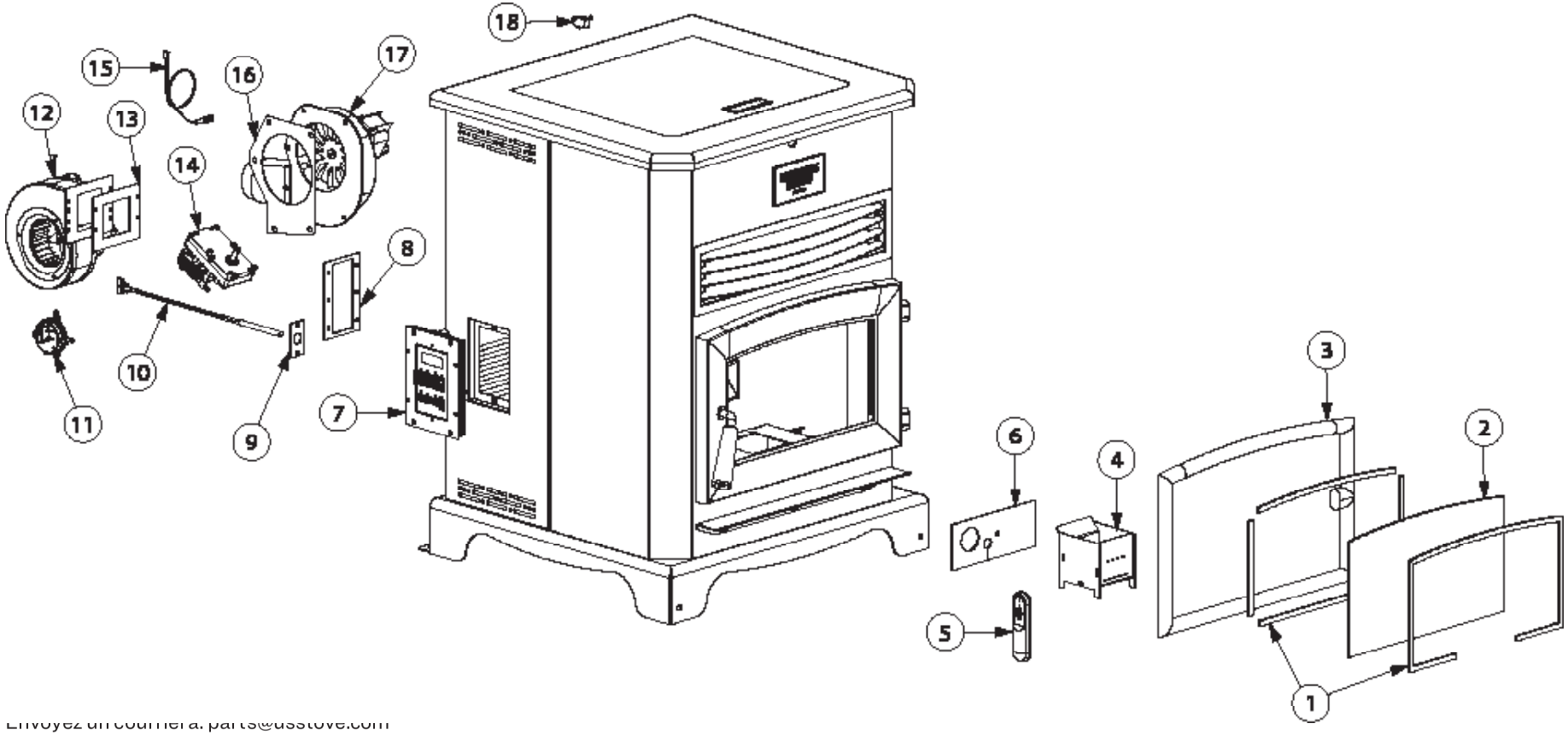


CORRECT



FAUX

ASSUREZ-VOUS QUE LES FILS SONT CONNECTÉS AUX DEUX BROCHES INFÉRIEURES DE L'INTERRUPTEUR DE LA TRÉMIE, COMME ILLUSTRÉ.



Envoyez un courriel à: parts@usstove.com

Clé	Partie	La Description	Qté
1	88174	Joint de verre - plat (3 / 16T x 3 / 8W)	1
2	893159	Verre propre	1
3	88324	Joint de corde de 1 po	1
4	69762	Assemblage du pot de combustion	1
5	80780	Télécommande IR	1
6	88168	Joint du boîtier du pot de combustion	1
7	80778	Circuit Board Assy.	1
8	88117	Joint de conduit d'échappement	1
9	88118	Joint de bride d'allumage	1

10	80869	Ignitor céramique	1
11	80549	Pressostat	1
12	80472	Ventilateur de distribution	1
13	88106	Joint de ventilateur de distribution	1
14	80488	Moteur d'entraînement (1,5 tr / min CCW)	1
15	80480	Thermistance	1
16	88100	Joint de ventilateur d'échappement	1
17	80473	Souffleur d'échappement	1
18	80491	Micro-interrupteur	1

AFIN DE MAINTENIR LA GARANTIE, LES COMPOSANTS DOIVENT ÊTRE REMPLACÉS PAR DES PIÈCES D'ORIGINE DU FABRICANT ACHETÉS AUPRÈS DE VOTRE REVENDEUR OU DIRECTEMENT AUPRÈS DU FABRICANT DE L'APPAREIL. L'UTILISATION DE COMPOSANTS TIERS ANNULERA LA GARANTIE.

Code d'erreur	Description de l'erreur	Causes possibles
Err1	Le capteur de limite élevée de température s'est déclenché.	Ventilation inadéquate. Panne du ventilateur de la pièce. Blocage de l'évacuation. Circuit électrique ouvert.
Err2	Le poêle est tombé à court de combustible pendant le fonctionnement normal.	Trémie vide. Panne ou blocage de la sortie de la vis sans fin. La flamme ou la qualité du combustible a entraîné un feu qui brûle trop lentement ou s'éteint. Circuit électrique ouvert.
Err3	Le poêle a été incapable d'atteindre la température de mise en marche du ventilateur de la pièce dans le délai de mise en route.	La flamme ou la qualité du combustible a entraîné un feu qui brûle trop lentement ou s'éteint. Panne de la sortie de la vis sans fin Trémie vide lors de la mise en marche.
Err4	Une panne d'alimentation électrique a eu lieu tandis que le poêle était chaud et lorsque l'alimentation a été restaurée, le feu était éteint.	Circuit électrique ouvert. Perte de puissance
Err5	Le fusible de sortie de la vis sans fin a sauté.	Moteur de la vis sans fin bloqué ou défectueux.
Err6	Le fusible de sortie de l'igniteur a sauté.	Igniteur court-circuité ou défectueux.
Err7	Le fusible de sortie du ventilateur de tirage (ventilateur d'évacuation) a sauté.	Moteur du ventilateur de tirage bloqué ou défectueux.
Err8	Le fusible de sortie du ventilateur de la pièce a sauté.	Moteur du ventilateur de la pièce bloqué ou défectueux.

INDICATEURS D'AFFICHAGES

Plusieurs situations ou événements sont indiqués lors du fonctionnement normal par le biais d'indicateurs d'affichage ou segments clignotant sur l'écran:

Indicateur «On» clignotant: Cela signifie que le poêle est dans l'état «Démarrage» en attendant la fin de la procédure d'allumage.

Indicateur «Off» clignotant: Cela indique que le poêle est en cours d' «extinction», en attente que le bouton OFF soit pressé, ou pendant un délai de 15 minutes après que le poêle ait été éteint ou encore que le poêle refroidisse.

Tiret clignotant sur l'affichage du niveau de chaleur (Heat Range): Cela indique que le poêle est en mode de fonctionnement normal et qu'il se met en marche à partir du réglage du niveau de chaleur actuel jusqu'au réglage du niveau de chaleur indiqué. Une fois que le temps de mise en œuvre est terminé, le tiret s'arrête de clignoter. Pour la mise en marche du niveau de chaleur de 1 à 5, le délai par défaut est de 12 minutes (avec un délai de mise en œuvre de 90 secondes).

Indicateur du mode Automatique («Automatic Mode») clignotant: Ceci indique que le poêle fonctionne normalement et fonctionne en mode automatique. Toutefois, le réglage du ventilateur de tirage ou du ventilateur de pièce est configuré manuellement.

Indicateur du réglage du ventilateur de tirage («Draft Fan») clignotant: Cela indique que le poêle fonctionne normalement et que le capteur de vide détecte une perte de pression due au fait que la porte soit ouverte ou en raison d'une pression négative dans la pièce par rapport à l'évacuation.

Indicateur «Aux» clignotant: Cela indique que l'igniteur est en marche pendant la phase d'allumage.

Indicateur de réglage du niveau de chaleur (Heat Range) clignotant rapidement (deux fois par seconde): Cela indique que le poêle fonctionne normalement et qu'une condition de température excessive existe, provoquant l'arrêt du combustible.

Indicateur de réglage du niveau de chaleur (Heat Range) clignotant lentement (une fois par seconde): Cela indique que le poêle est en condition de réduction, essayant d'éviter un arrêt dû à une température excessive.

DÉFAUTS D'USINE

Pour renvoyer les commandes à leurs réglages originaux d'usine, appuyez et maintenez enfoncés simultanément les bouton AUX UP et AUX DOWN pendant trois secondes.

- Déconnectez le cordon d'alimentation avant d'effectuer tout travail d'entretien ! REMARQUE: Mettre l'interrupteur ON/OFF (marche/arrêt) sur "OFF" ne coupe pas l'alimentation des composants électriques du poêle.
- Ne tentez jamais de réparer ou de remplacer une pièce du poêle à moins que des instructions pour le faire ne soient fournies dans ce manuel. Tous les autres travaux devront être effectués par un technicien qualifié.

PROBLÈME	CAUSE: Pour enrichir le mélange air/combustible
Flamme faible, orange_dépôt excessif de combustible dans le pot de combustion	Nettoyez le pot de combustion et le logement du pot de combustion Assurez-vous que la porte d'inspection soit fermée et scellée correctement. Si ce n'est pas le cas, réglez la fermeture de la porte et/ou remplacez les joints de la porte. Vérifiez que tous les raccordements externes ne présentent aucune obstruction. Vérifiez le système d'aspiration ; nettoyez-le si nécessaire.
PROBLÈME	CAUSE: Le pot de combustion brûle sans combustible
Le feu ou le poêle s'éteignent.	La trémie est vide, remplissez la trémie. Perte de pression de tirage. Assurez-vous que la porte d'inspection soit fermée et scellée correctement. Si ce n'est pas le cas, réglez la fermeture de la porte et/ou remplacez les joints de la porte. Vérifiez que tous les raccordements externes ne présentent aucune obstruction. Vérifiez le système d'aspiration ; nettoyez-le si nécessaire. Vérifiez que le raccordement du pressostat au foyer ne contienne aucune cendre ni obstruction. Le système à vis sans fin est bloqué ou il y a une « voûte » de combustible dans la trémie, qui empêche le combustible de s'écouler dans le système d'approvisionnement à vis sans fin.
PROBLÈME	CAUSE: L'allumeur automatique n'allume pas le combustible dans le pot de combustion.
Le poêle ne démarre pas un feu quand le bouton «ON» (marche) est pressé	Mettez le poêle en position "OFF" (arrêt). Retirez le combustible non brûlé du pot de combustion et essayez de nouveau. Vérifiez la qualité des granulés. Remplacez-les s'ils sont mouillés, humides ou sales. Perte de pression de tirage. Assurez-vous que la porte d'inspection soit fermée et scellée correctement. Si ce n'est pas le cas, réglez la fermeture de la porte et/ou remplacez les joints de la porte. Vérifiez que tous les raccordements externes ne présentent aucune obstruction. Vérifiez le système d'aspiration ; nettoyez-le si nécessaire. Vérifiez que l'allumeur automatique ne soit pas bloqué par des cendres ou de la suie. (L'allumeur est situé derrière le pot de combustion sur la paroi arrière du foyer.) Vérifiez que le raccordement du pressostat au foyer ne contienne aucune cendre ni obstruction. L'allumeur automatique devient « rouge vif » lors du démarrage. Si vous ne pouvez pas observer le rougeoiement de l'allumeur pendant le démarrage, alors il se peut que l'allumeur doive être remplacé ou qu'il y ait un problème avec le système de contrôle électrique.
PROBLÈME	CAUSE: Panne de courant
Vivre une faible pression d'échappement	Éteignez la carte de circuit imprimé et rallumez-la.

AVERTISSEMENT: N'ESSAYEZ PAS DE FAIRE FONCTIONNER LE NETTOYEUR DE TUBES DE L'ÉCHANGEUR THERMIQUE DURANT LE FONCTIONNEMENT OU LE REFROIDISSEMENT DU POÊLE À GRANULÉS, ATTENDEZ SON COMPET REFROIDISSEMENT AVANT DE COMMENCER CETTE PROCÉDURE DE NETTOYAGE.

CALENDRIER D'ENTRETIEN

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

	Tous les jours	Toutes les semaines	Tous les mois ou selon les besoins
Pot de combustion	Agité	Vidé	
Chambre de combustion		Brossée	
Cendres		Vérifiées	Vidées
Chambres intérieures			Aspirées
Pales du ventilateur de combustion			Aspirées / Brossées
Turbine du ventilateur de convection			Aspirée / Brossée
Système d'évacuation			Nettoyé
Joints			Inspectés
Vitre	Essuyée	Nettoyée	
Trémie (fin de saison)			Vidée et aspirée

COMMANDE DE PIÈCES DE RECHANGE

POUR L'ASSISTANCE SUR LES PIÈCES, APPELEZ LE 800-750-2723, POSTE 5051 OU PAR COURRIEL: PARTS@USSTOVE.COM

Les informations contenues dans ce manuel du propriétaire sont spécifiques à votre appareil. Lors de la commande de pièces de rechange, les informations contenues dans ce manuel vous aideront à vous assurer que les bons articles sont commandés. Avant de contacter le service client, notez le numéro de modèle et le numéro de série de cet appareil. Cette information se trouve sur l'étiquette de certification apposée à l'arrière de l'appareil. D'autres informations qui pourraient être nécessaires sont le numéro de pièce et la description de l'article en question. Les références et les descriptions se trouvent dans la section «Pièces de réparation» de ce manuel. Une fois ces informations recueillies, vous pouvez contacter le service client par téléphone au 1-800-750-2723, poste 5051 ou par e-mail à parts@usstove.com.

Informations sur le modèle	
Numéro de modèle	
Numéro de série	

FUMÉE ET CO MONITEURS

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

VÉRIFICATION ET NETTOYAGE DE LA TRÉMIE

Vérifiez périodiquement la trémie pour déterminer si de la sciure (des fines) s'est accumulée dans le système d'alimentation ou si des granulés sont restés collés à la surface de la trémie. Nettoyez-les si nécessaire.

JOINTS DE PORTE ET DE VITRE

Inspecter régulièrement les principales portes et fenêtres en verre joints. La porte principale peut avoir besoin d'être enlevé pour avoir des joints effilochés, brisés ou compactés remplacés par votre revendeur agréé. La porte de cet appareil utilise un joint 3/4 po corde de diamètre.

MOTEURS DES VENTILATEURS

Nettoyez tous les ans les orifices d'aération des moteurs des ventilateurs d'évacuation et de distribution. Retirez le ventilateur d'évacuation du conduit d'évacuation et nettoyez ses pales dans le cadre des opérations de mise en marche en automne.

PEINTURE DE SURFACE

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

VERRE

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

1. Une fois le radiateur refroidi, retirez la porte du radiateur.
2. Retirez le joint de corde de la porte, puis les écrous retenant le dispositif de retenue du verre en place.
3. Tout en portant des gants, retirez soigneusement les morceaux de verre détachés du cadre de la porte.
4. Remplacez la vitre et le joint en vous assurant que le joint parcourt tout le périmètre du bord du verre.
5. Réinstaller le dispositif de retenue et les huit écrous et le joint de corde à l'aide de silicone haute température pour faire adhérer le joint à la porte.
6. N'utilisez jamais de matériaux de substitution pour le verre.

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

MISE EN MARCHE À L'AUTOMNE

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

ARRÊT AU PRINTEMPS

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

NE JAMAIS UTILISER CE PRODUIT SANS SURVEILLANCE

AVERTISSEMENT:

- **LE DÉFAUT DE NETTOYAGE ET D'ENTRETIEN DE CET APPAREIL COMME INDIQUÉ PEUT ENTRAÎNER UNE BAISSE DES PERFORMANCES ET UN RISQUE POUR LA SÉCURITÉ.**
- **DÉBRANCHEZ LE CORDON ÉLECTRIQUE DU POÊLE AVANT DE RETIRER LE PANNEAU ARRIÈRE OU D'OUVRIR LE SYSTÈME D'ÉVACUATION POUR TOUTE TÂCHE D'INSPECTION, DE NETTOYAGE OU D'ENTRETIEN.**
- **NE PROCÉDEZ JAMAIS À L'INSPECTION, AU NETTOYAGE OU À L'ENTRETIEN SUR UN POÊLE CHAUD.**
- **N'UTILISEZ PAS LE POÊLE SI LA VITRE EST CASSÉE, IL POURRAIT EN RÉSULTER UNE FUITE DE GAZ DE COMBUSTION.**
- **LES TENTATIVES D'OBTENIR DES TAUX DE SORTIE DE CHALEUR QUI DÉPASSENT LES SPÉCIFICATIONS DE CONCEPTION DU CHAUFFAGE PEUVENT CAUSER DES DOMMAGES PERMANENTS AU CHAUFFAGE.**

FORMATION, INSPECTION ET ÉLIMINATION DE LA CRÉOSOTE

MISE EN GARDE:

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

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

CENDRES VOLANTES

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

ENLÈVEMENT ET ÉLIMINATION DES CENDRES

AVERTISSEMENT:

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

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

1. Laissez le feu s'éteindre et laissez l'appareil refroidir à température ambiante.
2. Assurez-vous que le poêle à granulés est à température ambiante avant de le toucher. Ouvrez la porte, retirez le pot de combustion et videz-le dans un récipient en métal.
3. Aspirez les cendres de la chambre de combustion. ASSUREZ-VOUS QUE LES CENDRES SONT FROIDES AU TOUCHER AVANT D'ASPIRER. Certains aspirateurs peuvent laisser échapper des cendres dans la pièce. Votre aspirateur doit avoir un filtre ou un sac spécial pour éliminer les fuites.
4. Réinstallez le pot de combustion.

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

AVERTISSEMENT DE SABOTAGE

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

PROCÉDURE D'ARRÊT

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

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

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

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

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

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

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

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

CHAMBRES INTÉRIEURES

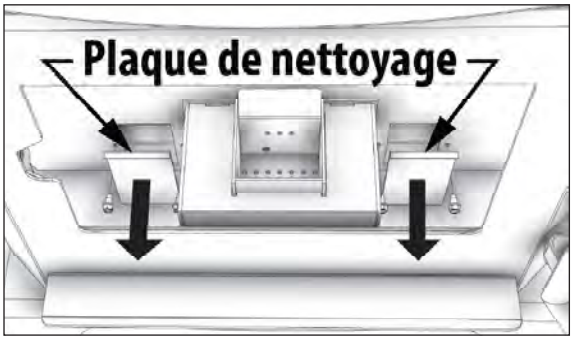
- **Pot de combustion -** Retirez et nettoyez périodiquement le pot de combustion et la zone à l'intérieur du boîtier du pot de combustion. En particulier, il est conseillé de nettoyer les trous du pot de combustion pour éliminer toute accumulation qui pourrait empêcher l'air de circuler librement dans le pot de combustion.
- **Échangeur de chaleur -** Deux plaques de nettoyage doivent être retirées afin de nettoyer les cendres volantes de l'échangeur de chaleur. Ouvrez la porte pour accéder aux nettoyages situés à l'intérieur de la chambre de combustion, un de chaque côté du pot de combustion. Les nettoyages sont fixés à la chambre de combustion avec (2) vis de 5/16 "chacun. Retirez les nettoyages et aspirez les cendres accumulées. Cela devrait être fait au moins une fois par mois ou plus fréquemment si de grandes quantités de cendres sont remarquées pendant le nettoyage ou si le poêle ne semble pas brûler correctement.

Au fil du temps, de la cendre ou de la poussière peuvent s'accumuler sur les pales des ventilateurs de circulation et d'extraction. Les ventilateurs doivent être inspectés périodiquement et, en cas d'accumulation, les nettoyer à l'aspirateur car les cendres ou la poussière peuvent nuire aux performances des ventilateurs. Il est également possible que la créosote puisse s'accumuler dans le ventilateur d'extraction, il doit donc être nettoyé à la brosse. Le ventilateur d'extraction se trouve derrière le panneau latéral gauche (face à l'avant du radiateur), le ventilateur de circulation se trouve derrière le panneau latéral droit. Pour accéder à l'allumeur, retirez le tube d'entrée d'air et le couvercle (2 vis). Le moteur de la vis sans fin est situé au centre arrière de l'unité. Remarque: lors du nettoyage, veillez à ne pas endommager les pales du ventilateur.

Si un aspirateur est utilisé pour nettoyer votre poêle, nous vous suggérons d'utiliser l'aspirateur AV15E AshVac. L'AV15E AshVac est conçu pour l'élimination des cendres. Certains aspirateurs ordinaires (c'est-à-dire les aspirateurs d'atelier) peuvent laisser échapper des cendres dans la pièce.

NE PAS ASPIRER LES CENDRES CHAUDES.

AVERTISSEMENT:
L'ENSEMBLE DE MAINTENANCE L'ENTRETIEN PROPRE DETERMINANT UNE PERFORMANCE DE CE POÊLE.



AVERTISSEMENT:

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

VÉRIFICATION AVANT LA MISE EN MARCHE

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

CONSTRUIRE UN FEU

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

- Assurez-vous que le pot de combustion ne contient pas de granulés.
- N'ouvrez PAS la porte de visualisation.
- N'ajoutez PAS de granulés dans le pot de combustion à la main.

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

IGNITEUR

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

Si le feu ne démarre pas dans 12 minutes, appuyez sur «Marche / Arrêt», attendez quelques minutes, dégagez le pot de combustion et recommencez la procédure.

OUVERTURE DE LA PORTE

Si la porte est ouverte pendant le fonctionnement du poêle, elle doit être refermée dans les 30 secondes, sinon le poêle s'éteint. Si le poêle s'éteint, appuyez sur l'interrupteur ON/OFF pour le redémarrer. Le poêle doit être complètement arrêté et débranché avant de pouvoir être redémarré.

AVERTISSEMENT:

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

VENTILATEUR DE LA PIÈCE

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

SI LE POÊLE MANQUE DE GRANULÉS

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

RECHARGE EN COMBUSTIBLE

AVERTISSEMENT:

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

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

Cet appareil est conçu pour brûler uniquement PFI pellets Premium qualité. NE PAS BRÛLER:

1. Des déchets;
2. Coupures de gazon ou les déchets de jardin;
3. Les matériaux contenant du caoutchouc, y compris les pneumatiques;
4. Les matériaux contenant de plastique;
5. Produits pétroliers des déchets, des peintures ou des diluants de peinture ou de produits d'asphalte;
6. Les matériaux contenant de l'amiante;
7. Les débris de construction ou de démolition;
8. Liens ou de bois traité sous pression Railroad;
9. Fumier ou restes d'animaux;
10. Sel de bois flotté de l'eau ou d'autres matériaux préalablement eau salée saturés;
11. Bois de; ou
12. Les produits de papier, de carton, de contreplaqué ou de particules. L'interdiction de la combustion de ces matériaux n'interdit pas l'utilisation des démarreurs de feu fabriqués à partir de papier, de carton, de sciure, de cire et substances similaires dans le but de déclencher un incendie dans un poêle à bois affecté.

Brûler ces matériaux peut entraîner la libération de fumées toxiques ou de rendre l'appareil de chauffage de la fumée inefficace et cause.

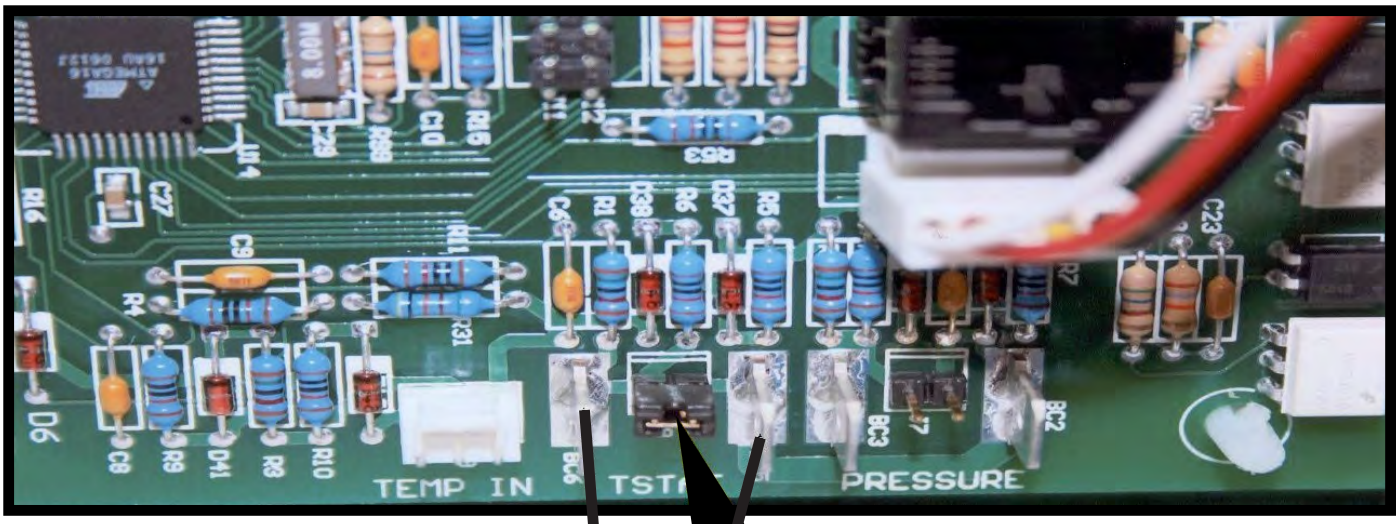
CARBURANT APPROPRIÉ

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

Votre poêle à granulés est conçu pour brûler des granulés de bois dur de qualité supérieure conformes à la norme PFI (Pellet Fuels Institute) (densité minimale de 40 lb par pied cube, diamètre de 1/4 à 5/16 moins de 8 200 BTU / lb, humidité inférieure à 8% en poids, cendres inférieure à 1% en poids et sel inférieur à 300 parties par million). Les granulés mous, contenant une quantité excessive de sciure de bois en vrac, qui ont été ou sont mouillés, réduiront les performances. Rangez vos pellets dans un endroit sec. NE stockez PAS le carburant dans les dégagements d'installation de l'appareil ou dans l'espace requis pour faire le plein et enlever les cendres. Cela pourrait provoquer un incendie. Ne pas trop brûler ou utiliser des combustibles volatiles ou des combustibles, cela pourrait causer des dommages aux personnes et à la propriété. Cet appareil n'est homologué que pour brûler du carburant sous forme de granulés de bois ! Les granulés approuvés mesurent 1/4 po. Ou 5/16 po. De diamètre et pas plus de 1 po. De long. Les granulés plus longs ou plus épais peuvent bloquer les ailettes de la tarière, ce qui empêche une bonne alimentation en granulés. Il est interdit de brûler du bois sous d'autres formes que des granulés. Il s'agirait d'une violation des codes du bâtiment pour lesquels le poêle a été approuvé, et cela annulerait toutes les garanties. La conception du poêle intègre l'alimentation automatique des granulés dans le feu selon un rythme soigneusement calculé. Un autre combustible introduit à la main n'augmenterait pas la production de chaleur, mais pourrait nuire gravement aux performances du poêle en générant beaucoup de fumée. Ne brûlez pas de granulés mouillés. Les performances du poêle dépendent fortement de la qualité des granulés. Évitez les marques de granulés qui présentent les caractéristiques suivantes :

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

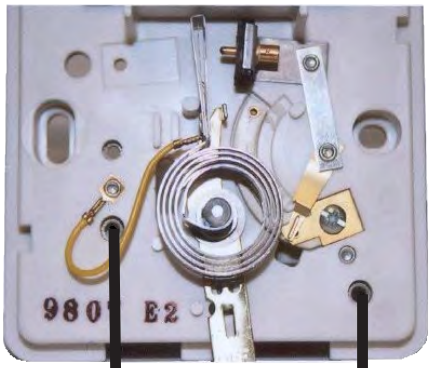
RACCORDEMENT DU THERMOSTAT



Le cavalier doit être enlevé en premier

1. Placez les bornes femelles sur les fils conducteurs de votre thermostat basse tension.
2. Branchez un fil de thermostat sur chacun des bornes du circuit imprimé.

REMARQUE IMPORTANTE: L'objet du T'Stat est de faire en sorte que le poêle se programme entre le réglage présélectionné de la plage de chaleur désirée («1» à «5») et le réglage de la plage de chaleur minimale de «1». ***Le T'Stat n'allumera ni ne éteindra le poêle.*** Lorsque la température ambiante souhaitée est atteinte et que le T'Stat n'a plus besoin de chaleur, le réglage de la plage de chauffage minimale est défini sur «1». ***L'unité ne s'éteindra pas complètement.*** Une fois que la température ambiante a baissé et que le T'Stat a besoin de plus de chaleur, l'appareil commencera à alimenter les granulés avec le réglage de chaleur présélectionné allant de "1" à "5".



Utilisez un fil de calibre 18, 2 conducteurs

- Lors de la mise en marche, l'allumage doit avoir lieu dans les 12 minutes ou le poêle émettra une erreur et affichera E3.
- Pendant la phase de démarrage, la touche Mode ne fonctionne pas.

B. **Gamme De Chaleur Boutons De Fleche**

- Ces boutons, une fois poussés, permettent de régler le débit d'alimentation en granules, d'où la puissance calorifique ou la plage de chaleur de votre poêle. Lors de l'utilisation de la télécommande manuelle, cette fonction peut être effectuée avec les touches "Haut / Bas".
- Les niveaux de sortie de chaleur changent de manière incrémentielle sur le diagramme à barres en commençant par la plage de chaleur "1" jusqu'à la plage de chaleur "5".

VUE D'ENSEMBLE DU PANNEAU DE CONTRÔLE

La mise en marche / arrêt du chauffage, ainsi que les réglages du débit d'alimentation en carburant et de la vitesse du ventilateur de la pièce sont effectués en appuyant sur le (s) bouton (s) approprié (s) sur le panneau de commande situé sur le côté inférieur gauche de votre appareil de chauffage.

- **ON/OFF**

Appuyer sur le bouton «ON» du panneau de contrôle démarrera la séquence de mise en marche du système de chauffage. Le combustible commencera à être alimenté grâce au système d'approvisionnement à vis sans fin puis s'allumera après environ 5 minutes.

Appuyer sur le bouton «OFF» du panneau de contrôle fera entrer le système de chauffage dans sa séquence d'arrêt. Le système d'approvisionnement du combustible arrêtera d'amener du combustible à partir de la vis sans fin et, une fois que le feu sera éteint et le système de chauffage refroidit, les ventilateurs s'arrêteront de fonctionner.

- **DEGRÉ DE CHALEUR**

Appuyer sur les flèches vers le haut et vers le bas «Heat Range» (Niveau de chaleur) permet de régler la quantité de combustible qui est approvisionnée au pot de combustion.

- **VENTILATEUR DE TIRAGE**

Le ventilateur de tirage (évacuation) s'allumera dès que le bouton «ON» sera pressé. Le ventilateur réglera automatiquement sa vitesse conformément au réglage du niveau de chaleur. Cependant, cette vitesse peut être réglée manuellement en appuyant sur les flèches haut et bas du ventilateur de tirage (Draft Fan). Lorsque le bouton «Draft Fan» (ventilateur de tirage) est appuyé, l'affichage indiquera «Df-A», qui est automatique. Appuyez de nouveau sur les flèches pour régler la vitesse du ventilateur. Quand le système de chauffage est en mode manuel, le thermostat en option ne contrôlera pas correctement l'unité. Lorsque vous ajustez le réglage du ventilateur de tirage, essayez seulement 1 réglage au-dessus ou en dessous du réglage de chaleur. Il est préférable de laisser le poêle en mode automatique.

- **VENTILATEUR DE LA PIÈCE**

Le ventilateur de la pièce s'allumera une fois que l'unité aura atteint la température de fonctionnement. En appuyant sur les boutons «Room Fan» du ventilateur de la pièce, l'affichage indiquera «Rf-A», ce qui correspond à automatique ou «Rf-1» à «Rf-9» pour les réglages manuels. En mode auto, la vitesse du ventilateur de la pièce sera automatiquement réglée conformément au réglage du niveau de chaleur. En appuyant sur les flèches haut et bas «Room Fan» du ventilateur de la pièce, vous pouvez régler le réglage de la vitesse du ventilateur jusqu'à «Rf-9». Le ventilateur de la pièce doit fonctionner à un niveau supérieur ou égal au réglage du niveau de chaleur.

- **AUX - UTILISÉ POUR RÉINITIALISER LE POÊLE AUX RÉGLAGES D'USINE**

Pour réinitialiser le poêle à ses réglages originaux d'usine, appuyez et maintenez enfoncés simultanément les boutons AUX UP et AUX DOWN pendant 3 secondes.

- **RETARDEMENT DE LA VIS SANS FIN**

Le bouton «Auger Delay» peut être utilisé pour mettre en pause la rotation de la vis sans fin pendant environ 1 minute. Cela peut être annulé en appuyant sur le bouton «ON». Le «Retardement de la vis sans fin» est normalement utilisé pendant le cycle de mise en route pour ralentir l'approvisionnement en combustible pendant l'allumage initial.

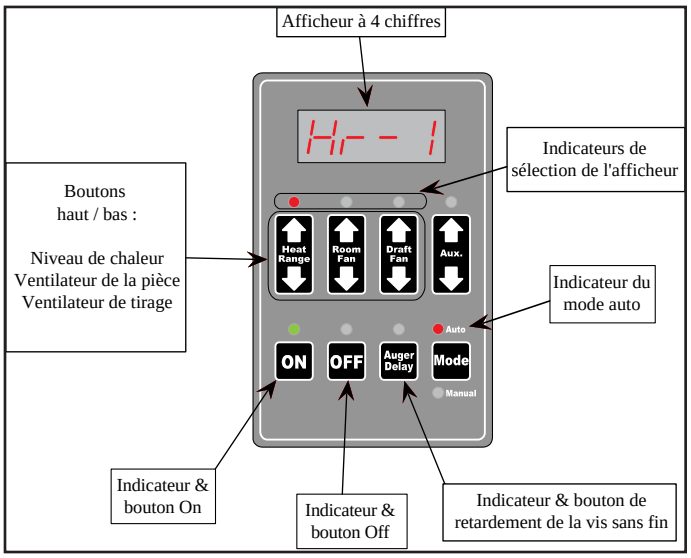
- **MODE**

Le bouton «Mode» n'est pas utilisé sur ce modèle.

Pendant le fonctionnement normal, l'unité est constamment surveillée pour les problèmes. En cas d'erreur, l'unité s'arrêtera et une erreur s'affichera. Consultez la liste des codes d'erreur à la fin de ce manuel.

NE JAMAIS UTILISER CE PRODUIT SANS SURVEILLANCE

COMMENT FONCTIONNE VOTRE POÊLE



Votre poêle à granulés utilise un système d'alimentation du combustible à vis sans fin inclinée qui est commandé par un circuit imprimé numérique contrôlé par microprocesseur. Le circuit imprimé numérique permet au système d'alimentation du combustible à vis sans fin inclinée de fonctionner dans un cycle non continu à minuterie ; ces cycles permettent à la vis sans fin de fonctionner durant une période prédéterminée de secondes. La vis sans fin pousse les granulés au-dessus d'un conduit situé devant/en bas de la trémie qui, elle, tombe à travers un autre conduit dans le pot de combustion. Votre poêle est équipé d'un système d'allumage automatique qui devra allumer le combustible dans un délai de 5 à 10 minutes en appuyant sur le bouton ON (Marche). Quand les granulés entrent dans le pot de combustion et s'allument, l'air extérieur est entraîné en direction du combustible et chauffé pendant le processus de combustion puis est aspiré à travers l'échangeur de chaleur par un moteur d'évacuation ou un ventilateur. Quand le poêle chauffe, l'air ambiant circule autour de l'échangeur de chaleur grâce à un ventilateur d'air ambiant, répartissant l'air chaud dans la pièce. La quantité de chaleur produite par le poêle est proportionnelle au taux de combustible qui est brûlée, et ce taux est contrôlé par le réglage du «Degré De Chaleur». Afin de conserver une combustion du combustible au taux souhaité, l'air fourni à la chambre de combustion par le ventilateur d'évacuation ou de tirage doit être maintenu de façon précise. Pas assez d'air provoquera une flamme peu énergétique ou faible. Si le combustible continue d'être approvisionné avec trop peu d'air pendant une durée suffisante, le pot de combustion se remplira avec trop de combustible et le feu s'étouffera. Trop d'air provoquera une flamme hyperactive ou agressive. La flamme dans cette situation est généralement très bleue à la base et ressemble à celle d'un chalumeau. Si cette situation persiste, le combustible dans le pot de combustion sera consumé et le feu s'éteindra. Faire correspondre la quantité d'air nécessaire pour une bonne combustion avec le taux de combustible est l'objectif principal de la combustion efficace des granulés de marques et qualités différentes à l'intérieur de votre poêle. Le rapport air/combustible peut être réglé pour permettre que presque n'importe quelle qualité de combustible brûle efficacement en respectant les procédures détaillées dans le reste de ce manuel. Comme une pression de tirage forcée est nécessaire au processus de combustion à l'intérieur de votre poêle, il est extrêmement important que le système d'évacuation soit installé correctement et maintenu. Et, que lors du fonctionnement de votre poêle, vous assuriez que la porte d'inspection soit correctement scellée.

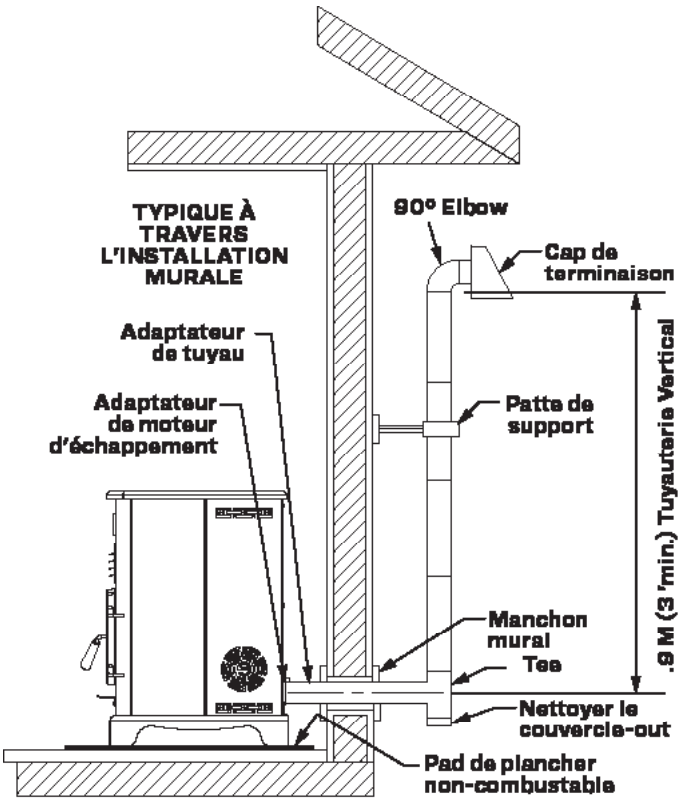
PANEL / TÉLÉCOMMANDES

Le fonctionnement de cet appareil peut être contrôlé depuis le panneau situé sur le côté du poêle et / ou par la télécommande. Les fonctions de contrôle sont les suivantes:

A. **Interrupteur Marche / Arrêt (Bouton "Alimentation")**

- Une fois poussé, le poêle s'allume automatiquement. Aucun autre allume-feu n'est nécessaire. L'allumeur restera allumé pendant au moins 10 et jusqu'à 12 minutes, selon le moment où la preuve de tir est atteinte. L'incendie devrait commencer dans environ 5 minutes.
- Après avoir appuyé sur "Power", le moteur de la vis est activé pendant 3,5 minutes, éteint pendant 1 minute. Pendant le reste de la période de démarrage, le moteur de la vis sans fin fonctionne sur le réglage "1" de la plage de chaleur.
- Pendant le démarrage, l'avance du niveau de chaleur (touches Haut et Bas) modifie le niveau de l'indicateur de plage de chaleur en conséquence, mais il n'y a aucun changement dans les conditions de fonctionnement du poêle avant la fin du démarrage.

GRÂCE À L'INSTALLATION DE MUR (INSTALLATION RECOMMANDÉE)



Les installations canadiennes doivent se conformer à la norme CAN/CSA-B365. Pour évacuer l'unité à travers la paroi, branchez l'adaptateur de tuyau à l'adaptateur de moteur d'échappement. Si l'adaptateur d'échappement est d'au moins 18 po (457 mm) au-dessus du niveau du sol, une section droite de tuyau d'évent peut être utilisé à travers le mur. Votre concessionnaire de chauffage devrait être en mesure de vous fournir un kit qui va gérer la plupart de cette installation, qui comprendra une bague murale qui permettra le jeu correct travers un mur combustible.

Une fois hors de la structure, un 3 po (76 mm) de dégagement devrait être maintenue dans le mur extérieur et un tee ressorte propre doit être placé sur le tuyau avec un 90 degrés tourner loin de la maison. À ce stade, une section de 3 pieds (0,91 m) (minimum) de la conduite devrait être ajouté avec un bouchon horizontale, qui viendrait compléter l'installation. Une patte de support doit être placé juste sous le bouchon de terminaison ou un tous les 4 pieds (1,22 m) pour rendre le système plus stable. Si vous habitez dans une région qui a fortes chutes de neige, il est recommandé que l'installation soit plus grand que 3 pieds (0,91 m) pour obtenir au-dessus de la ligne de congère. Cette même installation peut être utilisée si votre chauffe-eau est en dessous du niveau du sol en ajoutant simplement la section de nettoyage et tuyau vertical intérieur jusqu'à ce que le niveau du sol est atteint. Avec cette installation, vous devez être conscient de la hauteur de la neige, l'herbe morte, et les feuilles. Nous recommandons un (0,91 m) élévation verticale minimale de 3 pieds à l'intérieur ou à l'extérieur de la maison. L'installation "à travers le mur" est l'installation la moins chère et la plus simple. Ne jamais mettre fin à l'évent de fin sous un pont, dans une alcôve, sous une fenêtre, ou entre deux fenêtres.

INSTALLATION PAR LE TOIT/LE PLAFOND

- Lors de la ventilation du radiateur à travers le plafond, le tuyau est connecté de la même manière que dans le mur, sauf que le té de nettoyage est toujours à l'intérieur de la maison et qu'un adaptateur de 3 po (76 mm) est ajouté avant le nettoyage.
- Vous devez utiliser les brides de support de plafond et le solin de toit appropriés (fournis par le fabricant de tuyaux; suivez les instructions du fabricant de tuyaux). Il est important de noter que si votre longueur verticale de tuyau est supérieure à 12 pi (3,7 m), la taille du tuyau d'évent à granulés doit être augmentée à 4 po (102 mm) de diamètre.
- Ne dépassez pas plus de 4 pieds (1,22 m) de tuyau sur une longueur horizontale et utilisez le moins de coudes possible. Si un décalage est nécessaire, il est préférable d'installer des coudes à 45 degrés plutôt que des coudes à 90 degrés.

H. Dégagement minimum de 1 pi. (0,3 m) à l'horizontale de tout mur en matériau combustible.

I. Doit se trouver au minimum à 3 pi. (0,91 m) au-dessus du toit et à 2 pi. (0,61 m) au-dessus de toute faîtière du toit située à moins de 10 pi (3,05 m).

Déterminer où installer votre nouveau poêle à granulés. Pour obtenir l'utilisation la plus efficace possible de la chaleur recirculée, vous devriez envisager une pièce située au centre de votre maison. Choisissez une pièce grande et ouverte. Il est extrêmement important de maintenir des dégagements appropriés par rapport aux surfaces ou matériaux combustibles dans la pièce où votre appareil de chauffage sera situé. Vous pouvez trouver les mesures de dégagement appropriées dans ce manuel et sur l'étiquette signalétique de votre poêle à granulés. Le poêle à granules peut être ventilé à travers un mur extérieur ou dans une cheminée en maçonnerie ou en métal existante si le tuyau de ventilation «PL» ou «L» est utilisé dans toute la cheminée existante. La ventilation peut traverser le plafond et le toit si le tuyau approuvé est utilisé. Lorsqu'un passage à travers un mur ou une cloison de construction combustible est souhaité, l'installation doit être conforme à la norme CAN / CSA-B365.

AVERTISSEMENT:

- **NE PAS OBTENIR D'AIR DE COMBUSTION DU GRENIER, DU GARAGE OU DE TOUTE AUTRE ZONE NON VENTILÉE. VOUS POUVEZ OBTENIR DE L'AIR DE COMBUSTION À PARTIR D'UN ESPACE DE NAVIRE VENTILÉ.**
- **NE PAS INSTALLER D'AMORTISSEUR DE FUMÉE DANS LE SYSTÈME D'ÉVACUATION D'ÉCHAPPEMENT DE CET APPAREIL.**
- **NE RACCORDEZ PAS CET APPAREIL À UN CHEMINÉE DE CHEMINÉE SERVANT UN AUTRE CHAUFFAGE, FOURNAISE OU APPAREIL.**
- **INSTALLER L'ÉVENT AUX DÉGAGEMENTS SPÉCIFIÉS PAR LE FABRICANT DE L'ÉVENT.**
- **UTILISEZ UNIQUEMENT UN MATÉRIEL APPROUVÉ POUR L'INSTALLATION, LE NON-RESPECT DE CES INSTRUCTIONS PEUT ENTRAÎNER DES DOMMAGES MATÉRIELS, DES BLESSURES CORPORELLES OU MÊME LA MORT.**

Cet appareil est certifié pour une utilisation avec énuméré 3 pouces ou 4 pouces "PL" produits granulés de ventilation. L'utilisation d'autres composants autres que mentionnés ici pourrait causer des lésions corporelles, les dommages de chauffage, et annuler votre garantie.

ECHAPPEMENT HORIZONTALES INSTALLATION

1. Localisez votre poêle à granulés dans un endroit qui répond aux exigences de ce manuel, mais dans une zone où il ne gêne pas la charpente de la maison, le câblage, etc.
2. Installez un tampon de foyer non combustible sous le poêle à granulés. Ce coussin doit dépasser d'au moins 6 po (152 mm) en face de l'unité.
3. Placez le poêle à granulés environ 15 po (381 mm de) loin de la paroi intérieure.
4. Localisez le centre du tuyau d'échappement de votre unité. Ce point devrait ensuite être étendu à la paroi intérieure de votre maison. Une fois que vous avez localisé le point central, sur la paroi intérieure, couper un trou 7 po (175 mm) de diamètre dans le mur.
5. L'étape suivante consiste à installer le coupe-feu mural, reportez-vous aux instructions qui viennent avec le coupe-feu mural pour cette étape.
6. Installez la longueur appropriée du conduit d'évacuation des gaz d'échappement dans la gaine murale. Voir les étapes 11 et 12 pour déterminer la bonne longueur de conduit d'évacuation à utiliser.
7. **En dehors de l'air frais est obligatoire lors de l'installation de cette pastille salle de poêle de chauffage dans les maisons étanches à l'air et les maisons mobiles. Assurez-vous que l'évent de l'air extérieur a un plafond approuvé sur elle pour empêcher les rongeurs d'entrer. Assurez-vous d'installer dans un endroit qui ne sera pas devenir bloqué avec de la neige, etc.**
8. Connectez le tuyau d'évacuation des gaz d'échappement à la sortie d'échappement de votre poêle à granulés.
9. Fixer tous les raccords de ventilation conjointes avec 3 vis. Sceller le conduit d'évacuation des connexions communes avec haute température silicone.
10. Poussez l'unité vers l'arrière à la paroi intérieure, en étant sûr de maintenir les distances minimales à combustibles 62 po (51 mm) à l'arrière de l'appareil. Sceller l'espace annulaire de la paroi virole et autour du tuyau de ventilation à haute température silicone.
11. Le tuyau d'évent d'échappement doit dépasser d'au moins 12 po (300mm) sur au-delà du mur extérieur. Sceller l'espace annulaire de la paroi virole et autour du tuyau de ventilation à haute température silicone.
12. Installez un bouchon de terminaison horizontal approuvé ou si nécessaire installer un coude à 90 ° et la longueur appropriée de ventilation verticale. Un capuchon d'évent vertical approuvé est recommandé.

deux coudes à 45 degrés et un coude à 90 degrés, etc.) pour conserver un tirage adéquat.

IMPORTANCE DU PROJET CORRECTE

Le tirage est la force qui déplace l'air de l'appareil à travers la cheminée. Le montant du projet dans votre cheminée dépend de la longueur de la cheminée, la géographie locale, les obstructions avoisinantes et d'autres facteurs. Trop projet peut causer des températures excessives dans l'appareil. Un tirage inadéquat peut provoquer un retour de fumée dans la pièce et «brancher» de la cheminée. Un tirage inadéquat entraînera l'appareil à une fuite de fumée dans la pièce par appareil et le connecteur de cheminée joints. Une combustion incontrôlable ou une température excessive indique un tirage excessif. Prendre en compte l'emplacement de la cheminée pour assurer qu'il ne soit pas trop proche de voisins ou dans une vallée qui peut causer des conditions insalubres ou nuisibles.

TYPE D'ÉVENT À GRANULÉS

Un système d'évacuation des granulés de type «PL» certifié de 3 pouces ou 4 pouces doit être utilisé pour l'installation et fixé au raccord de tuyau fourni à l'arrière du poêle (utilisez un adaptateur de 3 pouces à 4 pouces pour 4 pouces tuyau). La connexion à l'arrière du poêle doit être scellée à l'aide de Hi-Temp RTV. Utilisez un évent de 4 pouces si la hauteur de l'évent est supérieure à 12 pieds ou si l'installation est à plus de 2500 pieds au-dessus du niveau de la mer. Nous recommandons l'utilisation de tuyaux Simpson Dura-Vent® ou Metal-Fab® (si vous utilisez d'autres tuyaux, consultez les codes du bâtiment locaux et / ou les inspecteurs en bâtiment). N'utilisez pas de tuyau d'évent de gaz de type B ou de tuyau galvanisé avec cet appareil. Le tuyau d'évent à granulés est conçu pour être démonté pour le nettoyage et doit être vérifié plusieurs fois pendant la saison de combustion. Le tuyau d'évent à granulés n'est pas fourni avec l'appareil et doit être acheté séparément.

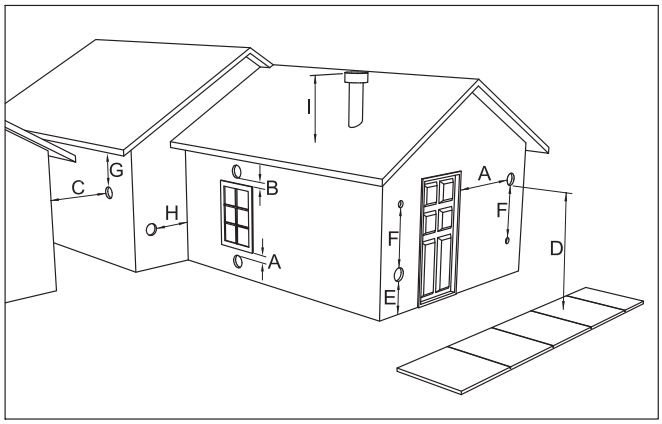
INSTALLATION D'ÉVENT À GRANULÉS

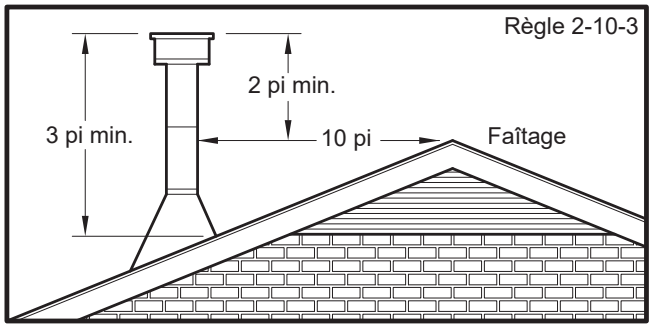
L'installation doit comprendre un té de nettoyage pour permettre la collecte des cendres volantes et pour permettre le nettoyage périodique du système d'échappement. Les coudes à 90 degrés accumulent les cendres volantes et la suie, réduisant ainsi le débit d'échappement et les performances du poêle. Chaque coude ou té réduit le potentiel de tirage de 30% à 50%. Tous les joints du système de ventilation doivent être fixés par au moins 3 vis, et tous les joints doivent être scellés avec du mastic silicone Hi-Temp RTV pour être hermétiques. La zone où le tuyau de ventilation pénètre à l'extérieur de la maison doit être scellée avec du silicone ou d'autres moyens pour maintenir le pare-vapeur entre l'extérieur et l'intérieur de la maison. Les surfaces de ventilation peuvent devenir suffisamment chaudes pour provoquer des brûlures si elles sont touchées par des enfants. Un blindage ou des protections non combustibles peuvent être nécessaires.

TERMINAISON D'ÉVENT À GRANULÉS

Ne terminez pas l'évent dans une zone fermée ou semi-fermée, telle que; abri d'auto, garage, grenier, vide sanitaire, sous une terrasse ou un porche, une allée étroite ou tout autre endroit qui peut accumuler une concentration de fumées. Une terminaison dans l'une de ces zones peut également entraîner des situations de pression imprévisibles avec l'appareil et entraîner des performances incorrectes et / ou un dysfonctionnement. La terminaison doit s'échapper au-dessus de l'élévation de l'entrée d'air extérieur. La terminaison ne doit pas être située là où elle sera obstruée par la neige ou d'autres matériaux. Ne pas terminer le conduit d'évacuation dans une cheminée en acier ou en maçonnerie existante..

DÉGAGEMENTS DE TERMINAISON D'ÉVENT





A. Dégagement minimum 4 pi. (1,22 m) sous ou à côté de toute porte ou fenêtre ouvrante.

B. Dégagement minimum de 1 pi. (0,3 m) au-dessus de toute porte ou fenêtre ouvrante.

C. Dégagement minimum de 3 pi. (0,91 m) de tout bâtiment adjacent.

D. Dégagement minimum de 7 pi. (2,13 m) au-dessus de tout passage public.

E. Dégagement minimum de 2 pi. (0,61 m) au-dessus de toute plante, herbe ou autre matériau combustible.

F. Dégagement minimum de 3 pi. (0,91 m) autour de l'entrée d'air forcée de tout appareil.

G. Dégagement minimum de 2 pi. (0,61 m) sous les avancées de toiture ou surplombs.

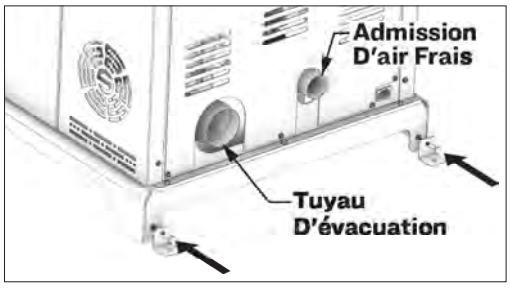
ALIMENTATION EN AIR EXTÉRIEUR (EN OPTION, SAUF SI INSTALLÉ DANS UNE MAISON MOBILE)

Selon votre emplacement et la construction de votre maison, l'air extérieur peut être nécessaire pour une performance optimale. Votre poêle est homologué pour être installé avec une prise d'air extérieur (69FAK) nécessaire pour une maison mobile. Vous pouvez acheter le 69FAK auprès de votre revendeur d'appareils de chauffage. Les instructions d'installation sont fournies avec le kit d'admission d'air.

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

FIXATION DE L'APPAREIL AU SOL

Utilisez les trous désignés pour fixer l'unité au sol.



AVERTISSEMENT ! - N'INSTALLEZ PAS L'APPAREIL DANS UNE CHAMBRE A COUCHER
ATTENTION ! - L'INTEGRITE STRUCTURELLE DU PLANCHER DE LA MAISON MOBILE, DES MURS ET DU TOIT DOIT ETRE PRESERVEE.
EN CAS D'INSTALLATION DANS UNE MAISON MOBILE, LE POÊLE DOIT ÊTRE MIS À LA TERRE DIRECTEMENT SUR LE CHÂSSIS D'ACIER ET BOULONNÉ AU SOL.

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

- Ce poêle doit être solidement fixé au plancher de la maison mobile à l'aide de deux tire-fonds de 1/4 "qui sont assez longs pour passer à la fois par un coussin de foyer, s'il est utilisé, et le plancher de la maison.
- Le radiateur doit être mis à la terre électriquement au châssis en acier de la maison mobile avec un fil de cuivre de 8 GA à l'aide d'une rondelle dentelée ou en étoile pour pénétrer la peinture ou le revêtement protecteur afin d'assurer la mise à la terre.
- L'évent doit être de 3 ou 4 po «PL» et doit dépasser d'au moins 36 po (914 mm) au-dessus de la ligne de toit de la maison mobile et doit être installé à l'aide d'un coupe-feu de plafond certifié et d'un chapeau de pluie.
- Lors du déménagement de votre maison mobile, toute ventilation extérieure doit être enlevée pendant le déplacement de la maison mobile. Après le déplacement, tous les évents doivent être réinstallés et solidement fixés.
- L'air extérieur est obligatoire pour l'installation d'une maison mobile. Consultez la section Alimentation en air extérieur et votre revendeur pour l'achat.
- Vérifiez auprès de vos responsables locaux du bâtiment car d'autres codes peuvent s'appliquer.

EXIGENCES POUR L'EVACUATION

AVERTISSEMENT:
• **INSTALLEZ L'ÉVACUATION DES FUMÉES EN RESPECTANT LES DÉGAGEMENTS SPÉCIFIÉS PAR LE FABRICANT D'ÉVACUATIONS.**
• **NE RELIEZ PAS L'ÉVACUATION POUR POÊLE À GRANULÉS À UNE ÉVACUATION UTILISÉE POUR UN AUTRE APPAREIL OU UN AUTRE POÊLE.**
• **N'INSTALLEZ PAS DE REGISTRE DE TIRAGE SUR LE SYSTÈME D'ÉVACUATION DE CET APPAREIL.**

Les directives d'installation ci-dessous doivent être respectées pour garantir la conformité tant avec la liste de sécurité de ce poêle qu'avec les codes de construction locaux. Ne pas recourir à des méthodes de fortune ou à des compromis lors de l'installation.

IMPORTANT:
CET APPAREIL EST ÉQUIPÉ D'UN SYSTÈME À TIRAGE NÉGATIF QUI ASPIRE L'AIR À TRAVERS LE POT DE COMBUSTION ET POUSSE L'ÉCHAPPEMENT HORS DU LOGEMENT. SI CET APPAREIL EST CONNECTÉ À UN SYSTÈME DE CHEMINÉE AUTRE QUE CELUI DÉCRIT DANS CE MANUEL, IL NE FONCTIONNERA PAS CORRECTEMENT.

DISTANCE D'EVACUATION MAXIMALE

L'installation DOIT comporter au moins 3 pi (91 cm) de conduit vertical hors de la maison. Ceci crée un appel d'air naturel qui limite le risque de fumée ou d'odeur lors de l'arrêt de l'appareil et évite que l'évacuation ne provoque des nuisances et un danger en exposant les personnes ou les buissons à des températures élevées. La hauteur verticale maximale recommandée pour l'évacuation des fumées est de 12 pi (3,66 m) pour une évacuation de type « PL » de 3 po (76 mm). La longueur totale de l'évacuation horizontale NE DOIT PAS dépasser 4 pi (1,22 m). Ceci pourrait provoquer une contre-pression. N'utilisez pas plus de 180 degrés de coudage (deux coudes à 90 degrés, ou

OPTIONS D'INSTALLATION

Unité autoportante - supportée par un piédestal / pieds et placée sur une surface de plancher incombustible conformément aux exigences de dégagement pour une installation de poêle autoportante.

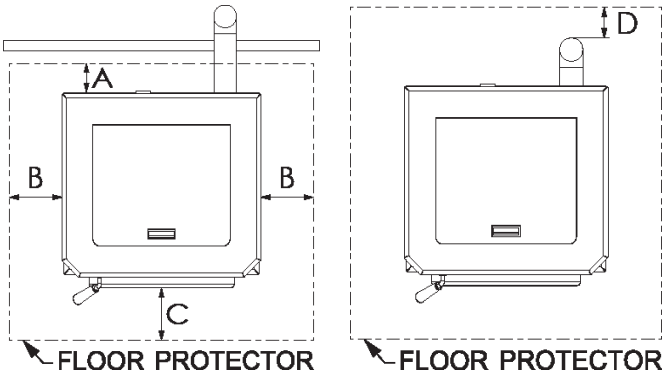
Unité d'alcôve - supportée par un piédestal / des pieds et placée sur une surface de plancher incombustible conformément aux exigences de dégagement pour une installation en alcôve.

INSTALLATION INCORRECTE

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

PROTECTION DU SOL

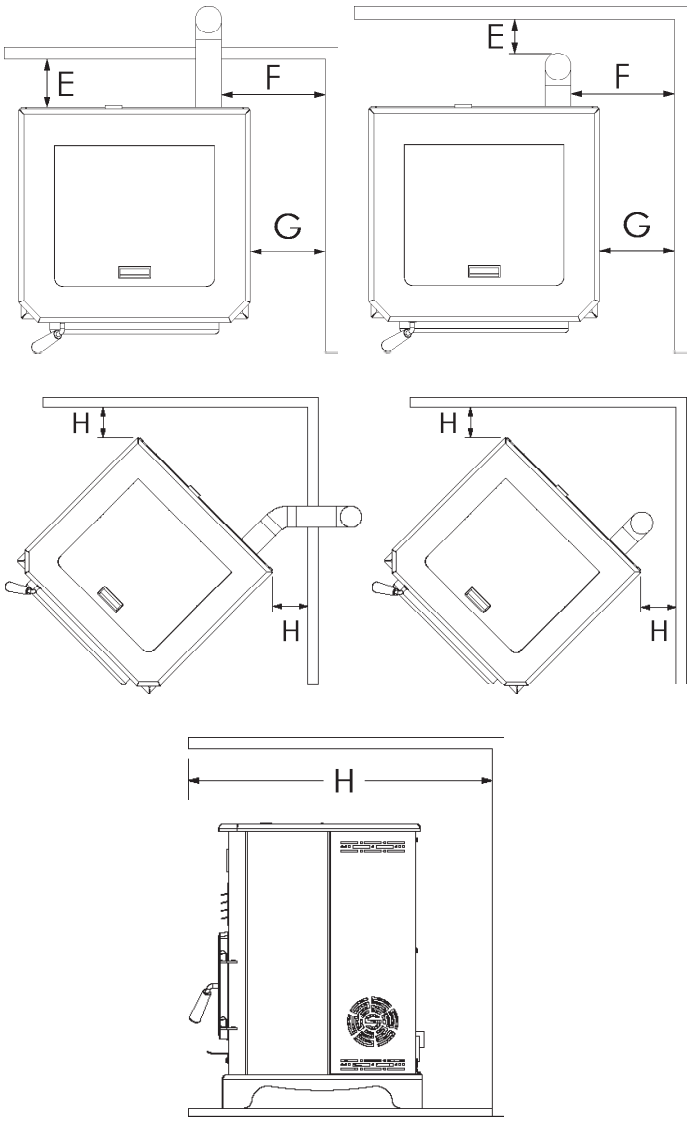
Cet appareil doit être installé sur une surface de plancher incombustible. Si un coussin de sol est utilisé, il doit être certifié ou équivalent. Le plancher ou la surface incombustible doit être suffisamment grand pour s'étendre sur au moins 6 po (153 mm) à l'avant, 6 po (153 mm) de chaque côté et 1 po (26 mm) derrière le poêle. La protection du plancher doit s'étendre sous et 2 po (51 mm) de chaque côté du té de cheminée pour une installation verticale intérieure. Un protecteur de plancher de 1 po (26 mm) d'épaisseur est recommandé pour cette installation. Les installations canadiennes nécessitent 18 po (450 mm) devant l'unité.



Dimensions		po	mm
A	Arrière (à travers le mur)	1	25
B	Côté	6	152
C	De face	*6	*152
D	Arrière (intérieur vertical)	2	50
* L'installation au Canada nécessite 18 po (450 mm) devant l'unité.			

DÉGAGEMENTS

Votre poêle à granules a été testé et répertorié pour une installation dans une maison résidentielle et mobile conformément aux dégagements indiqués ci-dessous. Pour des raisons de sécurité, veuillez respecter les dégagements et restrictions d'installation. Toute réduction du jeu aux combustibles ne peut être effectuée que par des moyens approuvés par une autorité réglementaire.



			po	mm
PARALLÈLE	E	Mur arrière à l'unité	2	50
	F	Paroi latérale au carneau	13	330
	G	Paroi latérale au bord supérieur de l'unité	8	203
COIN	H	Mur adjacent à l'unité	8	203
ALCÔVE	J	Profondeur de l'alcôve	36	914

AVIS DE SÉCURITÉ

- **SI CE POÊLE N'EST PAS INSTALLÉ CORRECTEMENT, UN INCENDIE PEUT EN RÉSULTER. POUR RÉDUIRE LES RISQUES D'INCENDIE, SUIVEZ LES INSTRUCTIONS D'INSTALLATION.**
- **ADRESSEZ-VOUS AUX AUTORITÉS LOCALES DE L'URBANISME POUR OBTENIR UN PERMIS ET DES RENSEIGNEMENTS SUR TOUTE AUTRE RESTRICTION À L'INSTALLATION ET SUR LES EXIGENCES D'INSPECTION DANS VOTRE RÉGION.**
- **NE PLACEZ AUCUN VÊTEMENT OU AUTRE OBJET INFLAMMABLE SUR OU PRÈS DU POÊLE.**
- **N'UTILISEZ JAMAIS D'ESSENCE, DE COMBUSTIBLE À LANTERNE DE TYPE ESSENCE, DE KÉROSÈNE, D'ESSENCE D'ALLUME-FEU OU D'AUTRES LIQUIDES SIMILAIRES POUR ALLUMER OU RAVIVER LE FEU DANS CE POÊLE. GARDEZ TOUS CES LIQUIDES ÉLOIGNÉS DU POÊLE LORSQU'IL EST EN MARCHE.**
- **CET APPAREIL EST UN APPAREIL DE CHAUFFAGE AUTONOME. IL N'EST PAS CONÇU POUR ÊTRE RELIÉ À DES CONDUITS DE DISTRIBUTION D'AIR. CE N'EST PAS UN FOURNEAU.**
- **INSTALLER L'ÉVENT AUX DÉGAGEMENTS SPÉCIFIÉS PAR LE FABRICANT DE L'ÉVENT.**
- **N'INSTALLEZ PAS DE REGISTRE DE TIRAGE SUR LE SYSTÈME D'ÉVACUATION DE CET APPAREIL.**
- **CE POÊLE DOIT ÊTRE RÉGULIÈREMENT ENTRETENU ET NETTOYÉ (VOIR LA SECTION « ENTRETIEN »). LE DÉFAUT D'ENTRETIEN DU POÊLE PEUT ENTRAÎNER UN FONCTIONNEMENT INAPPROPRIÉ ET DANGEREUX.**
- **UN DISJONCTEUR DOIT ÊTRE INSTALLÉ. CET APPAREIL DOIT ÊTRE BRANCHÉ SUR UNE PRISE MURALE AVEC TERRE DE 110-120 V, 60 Z. N'UTILISEZ PAS D'ADAPTATEUR DE PRISE ET NE COUPEZ PAS LA FICHE DE TERRE. N'ACHEMINEZ PAS LE CORDON ÉLECTRIQUE SOUS, DEVANT OU SUR LE POÊLE. NE FAITES PAS COURIR LE CORDON ÉLECTRIQUE DANS LES ZONES DE PASSAGE ET NE LE COINCEZ PAS SOUS LES MEUBLES.**

ATTENTION:

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

ATTENTION:

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

ATTENTION:

- **L'UTILISATION D'AIR EXTÉRIEUR N'EST PAS NÉCESSAIRE POUR CET APPAREIL.**
- **NE DÉBRANCHEZ PAS LE POÊLE SI VOUS SOUPÇONNEZ UN DYSFONCTIONNEMENT. PLACEZ LE CONTACTEUR ON/OFF SUR « OFF » PUIS PRENEZ CONTACT AVEC LE CONCESSIONNAIRE.**
- **LE POÊLE NE FONCTIONNE PAS PENDANT LES COUPURES DE COURANT. EN CAS DE PANNE DE COURANT, VEILLEZ AUX ÉMANATIONS DE FUMÉE DU POÊLE ET OUVREZ UNE FENÊTRE SI LA FUMÉE SE RÉPAND DANS LA PIÈCE.**
- **N'OBSTRUEZ JAMAIS LA CIRCULATION DE L'AIR DES GRILLES D'AÉRATION OUVERTES DE L'APPAREIL.**

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

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

https://nficertified.org,

https://www.wettinc.ca/

LISTE DE CONTRÔLE D'INSTALLATION

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

SERVICE CLIENTS

1-800-750-2723 poste 5050

Texte au 423-301-5624

E-mail à: customerservice@usstove.com

LISTE DE CONTRÔLE DE MISE EN SERVICE

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

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

S'il te plaît imprime

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

DESCRIPTION DU TRAVAIL

Emplacement de l'appareil installé: _____

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

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

MISE EN SERVICE

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

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

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

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

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

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

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

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

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

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

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

Propriétaire du domicile: CONSERVEZ CETTE INFORMATION POUR RÉFÉRENCE FUTURE

Votre poêle à pellets a été testé et répertorié conformément aux normes ASTM E1509-12 (2017), ULC-S627-00. Ce manuel décrit l'installation et le fonctionnement du poêle à granulés King modèle. Cet appareil de chauffage respecte les limites d'émission de bois en vigueur aux États-Unis en vertu de l'Environmental Protection Agency des États-Unis pour les appareils de chauffage au bois vendus après le 15 mai 2020. Dans des conditions de test spécifiques à l'EPA, l'utilisation de pellets de bois pour brûler cet appareil de chauffage a permis de générer de la chaleur à un débit de 8 932 à 25 701 Btu / h. Ce dispositif de chauffage a atteint un taux d'émission de particules de 1,3 g / h lorsqu'il a été testé selon la méthode ASTM E 2779 / EPA, méthode 28R et 64% d'efficacité.

Spécifications De Chauffage		
Brûler le combustible de tarif * (réglage le plus bas)	1,5 - 5 lbs./hr. (0,7 - 2,3 kg/hr)	* Taille de Pellet peut effectuer le taux réel d'alimentation en carburant et de brûler fois. Taux d'alimentation en carburant peut varier par autant que 20%. Utiliser PFI carburant listé pour de meilleurs résultats.
Temps de combustion (réglage le plus bas)	80 hrs.	
Capacité de la trémie	130lbs. (59kg)	
Spécifications Électriques		
Note électrique	110-120 volts, 60 HZ, 3 Amps	
Watts (opérationnel)	175 (approx.)	
Watts (allumeur en marche)	425 (approx.)	
Dimensions		
Hauteur X Largeur X Profondeur	34 po (864 mm) X 26 po (661 mm) X 26 po (661 mm)	

AVERTISSEMENT:

IL EST CONTRAIRE À LA RÉGLEMENTATION FÉDÉRALE D'UTILISER CE POÊLE À BOIS D'UNE MANIÈRE INCOMPATIBLE AVEC LES INSTRUCTIONS D'UTILISATION DU MANUEL DU PROPRIÉTAIRE.

Remarque: enregistrez votre produit en ligne sur www.usstove.com ou téléchargez l'application gratuite dès aujourd'hui. Cette application est disponible uniquement sur l'App Store pour iPhone et iPad. Rechercher US Stove. Conservez votre reçu avec vos dossiers pour toute réclamation.

Pour le service client, veuillez appeler: 1-800-750-2723 poste 5050 ou;

Texte au 423-301-5624 ou;

Écrivez-nous à:

customerservice@usstove.com

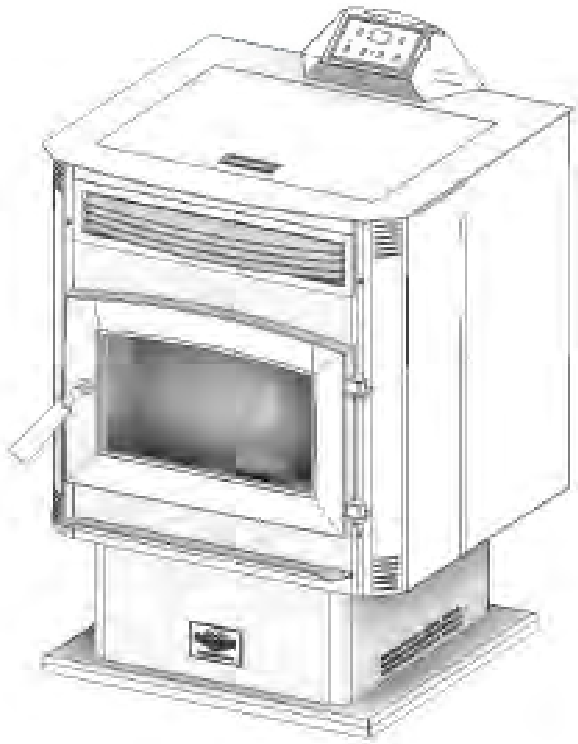
Manuel d’instructions et d’utilisation du propriétaire

Numéro De Modèle:

US5522

Signaler Le Numéro: F20-570

Certifié selon la norme ASTM E1509-12 (2017)
et Certifié ULC-S627-00-REV1
Mobile home approuvé



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

Conservez ces instructions dans un endroit sûr pour référence ultérieure.

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

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

AGENCE AMÉRICAINE DE PROTECTION DE L’ENVIRONNEMENT

Certifié conforme aux normes d’émissions de particules 2020.

AVERTISSEMENT SUR LA PROPOSITION 65 DE LA CALIFORNIE:

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

CE MANUEL EST SUJET À MODIFICATION SANS PRÉAVIS.

Owner's Instruction and Operation Manual

Ashley

America's Hearth Since 1905

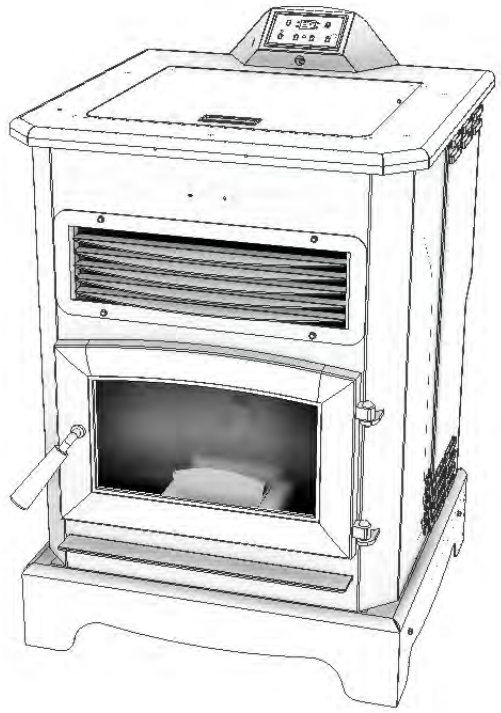
Model Number:

AP5622

PFS C US

Report Number: F20-570

Certified to ASTM E1509-12 (2017), and Certified to ULC-S627-00-REV1 Mobile Home Approved



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

853931-1106L

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 Could 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

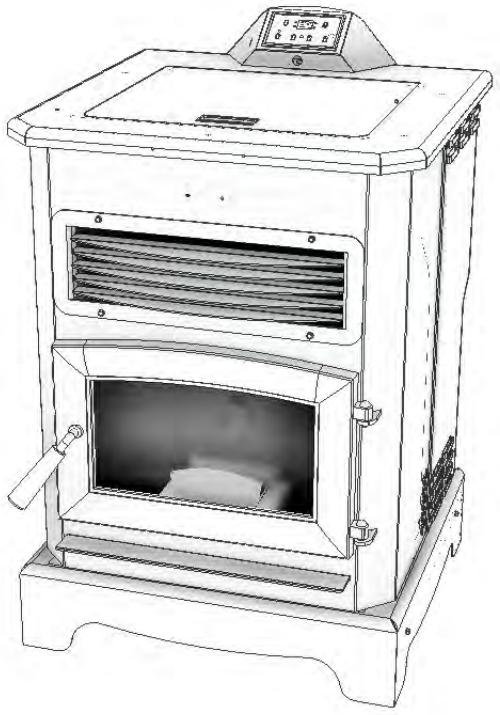
THIS MANUAL IS SUBJECT TO CHANGE WITHOUT NOTICE.

Owner's Instruction and Operation Manual

UNITED STATES STOVE CO.
ESTº 1869

Model Number:
KP130-B

PFS® C US
Report Number: F20-570
Certified to ASTM E1509-12 (2017)
and ULC-S627-00-REV1
Mobile Home Approved



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

853929-1106L

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.

Limited Warranty

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

TIME PERIOD	
Steel PartFirebox, Heat Exchanger, Door, Trim	Five Year Limited
Gaskets	One Year Limited
All Electrical Components (Blower, Auger / Agitator Motor, PC Board, Switches)	One Year Limited
Ceramic Glass	One Year Limited

WARRANTY CONDITIONS

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

CLAIM PROCEDURE

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

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

WARRANTY EXCLUSIONS

This warranty does not cover the following:

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

THIS WARRANTY IS VOID IF

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

LIMITATIONS OF LIABILITY

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

WARRANTOR

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

IMPORTANT

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

Garantie limitée

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

DÉLAI PRESCRIT	
Steel PartFirebox, Heat Exchanger, Door, Trim	Cinq ans limités
Joints d'étanchéité	Un an limités
Tous les composants électriques (Souffleur, moteur de la vis/agitateur, carte de circuit imprimé, commutateurs)	Un an limités
Vitre céramique	Un an limités

CONDITIONS DE LA GARANTIE

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

PROCÉDURE DE RÉCLAMATION

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

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

EXCLUSIONS DE LA GARANTIE

Cette garantie ne couvre pas ce qui suit:

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

CETTE GARANTIE EST ANNULÉE SI

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

RESTRICTIONS DE LA GARANTIE

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

GARANT

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

IMPORTANT

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

Owner's Instruction and Operation Manual

VOGELZANG

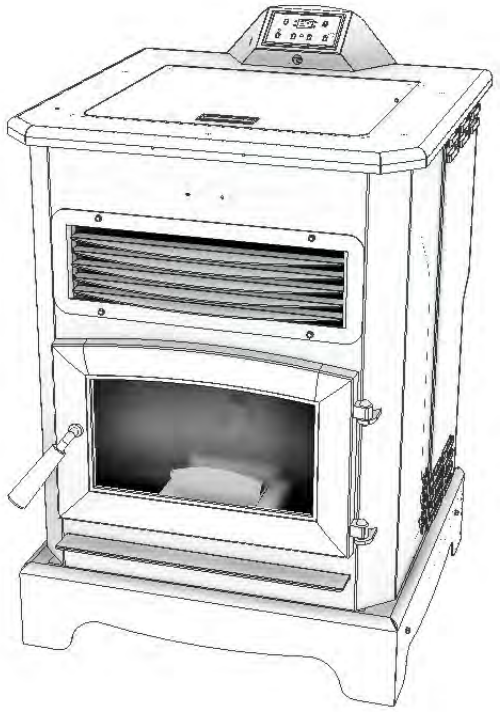
Model Number:

VG5722

PFS C US

Report #: F20-570

Certified to ASTM E1509-12 (2017), and Certified to ULC-S627-00-REV1 Mobile Home Approved



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

853140L-1106L

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.

Limited Warranty

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

TIME PERIOD	
Steel PartFirebox, Heat Exchanger, Door, Trim	Two Year Limited
Gaskets	One Year Limited
All Electrical Components (Blower, Auger / Agitator Motor, PC Board, Switches)	One Year Limited
Ceramic Glass	One Year Limited

WARRANTY CONDITIONS

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

CLAIM PROCEDURE

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

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

WARRANTY EXCLUSIONS

This warranty does not cover the following:

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

THIS WARRANTY IS VOID IF

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

LIMITATIONS OF LIABILITY

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

WARRANTOR

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

IMPORTANT

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

Garantie limitée

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

DÉLAI PRESCRIT	
Steel PartFirebox, Heat Exchanger, Door, Trim	Deux ans limités
Joints d'étanchéité	Un an limités
Tous les composants électriques (Souffleur, moteur de la vis/agitateur, carte de circuit imprimé, commutateurs)	Un an limités
Vitre céramique	Un an limités

CONDITIONS DE LA GARANTIE

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

PROCÉDURE DE RÉCLAMATION

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

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

EXCLUSIONS DE LA GARANTIE

Cette garantie ne couvre pas ce qui suit:

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

CETTE GARANTIE EST ANNULÉE SI

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

RESTRICTIONS DE LA GARANTIE

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

GARANT

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

IMPORTANT

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

LABELING VENDOR NOTES:

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

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

TEXT: ALL TEXT TO BE 0.07 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	3/21/22	GSC

1 INCH SQ. BORDER, LOGS AND FLAMES ARE TO BE RED

0.25 TEXT HEIGHT

0.125 TEXT HEIGHT

ATTENTION: 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.

0.25 TEXT HEIGHT

0.125 TEXT HEIGHT

ATTENTION: OPERATE THIS UNIT ONLY WITH THE FUEL HOPPER LID CLOSED. FAILURE TO DO SO MAY RESULT IN EMISSION OF PRODUCTS OF COMBUSTION FROM THE HOPPER UNDER CERTAIN CONDITIONS. MAINTAIN HOPPER SEAL IN GOOD CONDITION. DO NOT OVERFILL THE HOPPER.

CAUTION: Moving parts may cause injury. Do not operate with the side panels or repair panel removed. Do not place hands or fingers in the moving auger area at the bottom of the hopper. Do not obstruct the combustion air inlet opening at the rear of the appliance.
DANGER: Risk of electrical shock. Disconnect power before servicing unit. Route power supply cord away from the appliance.
Keep viewing and ash removal doors tightly closed during operation. Replace glass with 5mm ceramic glass ONLY.
IMPORTANT: When the hopper lid is open, the auger will stop. Close the hopper lid to allow system to operate. Provide a source of fresh air to the room where the appliance is installed. Do not obstruct the space beneath the appliance. Inspect and clean exhaust vent system frequently in accordance with manufacturer's instructions.
Install and use only in accordance with the manufacturer's installation and operating instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Do not install in a sleeping room.
Do not connect this unit to a chimney flue serving another appliance. Refer to local building codes and the installation and operating instructions for precautions required for passing an exhaust venting system through a combustible wall or ceiling.
Components required for residential or mobile home installation: Model PL Vent Chimney and Components - 3"/75mm or 4" 100mm diameter.
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 - Press the ON/OFF button. Green power light begins to blink. When the light becomes solid, set the desired heat level.
SHUT DOWN: Press the "OFF" button. Unit will shutdown automatically after fuel burns out and unit cools down.

0.10 TEXT HEIGHT

MODEL / MODÈLE : KP5522, US5522

TESTED TO/TESTÉ SELON: ASTM E1509-12 (2017), ULC-S627-00-REV1
Room Heater, Pellet Fuel-Burning Type, Also for Use in Mobile Homes. For use with wood pellet fuel only. Use of other fuels will void warranty.
Appareil de chauffage inséré de combustible solide/de type de boulettes. l'installation dans les maisons mobile. Pour Utilisation avec dec granulés uniquement! L'utilisation d'autres combustibles annulera la garantie.
INPUT RATING: 42,326 BTU/HR - ELECTRICAL RATING: 120V, 60Hz, 3A

Serial No. / N° de série

Manufacture Date. / Date de Fabrication

ENVIRONMENTAL PROTECTION AGENCY
Certified to comply with 2020 particulate emission standards. Tested to ASTM E2779-10 & ASTM E2515-17 - 1.5 g/hr. 76% Efficiency

Report No. / Rapport N° F20-570

U.S. Stove Company • 227 Industrial Park Road • South Pittsburg, TN 37380 • Phone: (800) 750-2723 • Web: www.usstove.com

ATTENTION: CHAUD PENDANT LE FONCTIONNEMENT-NE PAS TOUCHER MAINTENIR LES ENFANTS ET LES VÊTEMENTS ÉLOIGNÉS. TOUT CONTACT PEUT ENTRAÎNER DES BRÛLURES. CONSULTER LA PLAQUE SIGNALÉTIQUE ET LES INSTRUCTIONS. MAINTENIR LE MOBILIER ET LES AUTRES MATIÈRES COMBUSTIBLES À BONNE DISTANCE DE L'APPAREIL.

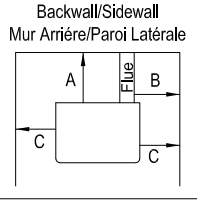
ATTENTION: FAIRE FONCTIONNER CETTE UNITÉ UNIQUEMENT AVEC LE COUVERCLE DE TRÉMIE DU COMBUSTIBLE FERMÉ. NES PAS LE FAIRE PEUT ENTRÎNER DES ÉMISSIONS DE PRODUITS DE LA TRÉMIE DANS CERTAINES CONDITIONS. D'ASSURER L'ÉTANCHÉITÉ TRÉMIE EN BON ETAT. NE PAS SURCHARGER LA TRÉMIE.

ATTENTION: Les pièces en mouvement peuvent provoquer des blessures. Ne pas faire fonctionner cette unité avec les panneaux latéraux ou le panneau arrière retirés. Ne pas placer les mains ou les doigts à l'intérieur de la zone de la vis sans fin en bas de la trémie. N'obstruez pas l'admission d'air de combustion.
DANGER: Risque de choc électrique. Déconnecter l'alimentation avant de réaliser l'entretien de l'unité. Faire passer le cordon d'alimentation à distance de l'unité.
Maintenir les portes d'inspection et de retrait des cendres bien fermées pendent le fonctionnement. Remplacer le verre uniquement par du verre céramique (5mm).
IMPORTANT: Quand le couvercle de la trémie est ouvert, la vis sans fin d'alimentation s'arrêtera. Fermer le couvercle pour permettre au système de fonctionner.
Fournir une source d'air frais dans le chambre. Ne pas obsturer l'espace sous l'app. de chauffage. Inspecter et nettoer fréquemment le système de ventilation d'évacuation conformément aux instructions du fabricant.
Installer et utiliser conformément aux instructions du fabricant uniquement. Contacter les fonctionnaires locaux de construction ou fonctionnaires des services d'incendie concernant les limitations et l'inspection de l'installation dans votre maison. Ne pas installer dans une chambre à coucher.
Ne pas connecter cette unité à un carneau de chiminée utilisé pour un autre appareil. Consulter le code local de construction et les instructions du fabricant pour les précautions requises pour passer à travers un mur ou un plafond combustible.
Composants nécessaires pour une installation dans une résidence ou une maison mobile: Ventilation modèle PL chiminée et composants - Diamètre de 3"/75mm ou 4"/100mm.
Ce poêle à bois doit inspection et la réparation périodique. Pour un fonctionnement correct, consultez le manuel du propriétaire pour plus d'informations. Ce est contre les règlements fédéraux pour faire fonctionner ce poêle à bois d'une manière incompatible avec les instructions d'utilisation dans le manuel du propriétaire.
MISE en MARCHE / Allumage Automatique - Appuyer sur le buoton ON/OFF. Le voyant vert se met à clignoter. Lorsque le voyant s'arrête de clignoter et reste allumé, régler le thermostat au niveau souhaité.
ARRÊT: Placer le réglage de chaleur sur "OFF". L'unité s'éteindra automatiquement une fois que le combustible sera consumé et que l'unité ait refroidi.

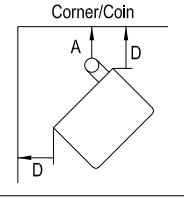
Clearances to Combustibles: Residential and Mobile Home
Dégagements Combustibles: Dans Une Résidence ou Une Maison Mobile

A - 2" / 50mm
B - 13" / 330mm
C - 8" / 203mm
D - 8" / 203mm
E - 36" / 914mm
F - 60" / 1.52M

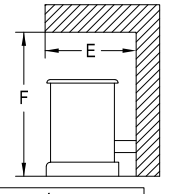
Backwall/Sidewall
Mur Arrière/Paroi Latérale



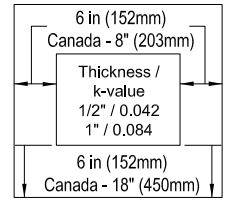
Corner/Coin



Alcove



1/2"(12.5mm) or 1"(25mm) Thick/Épais
Non-Combustible Floor Protection /
Un Protecteur de sol Non-Combustible



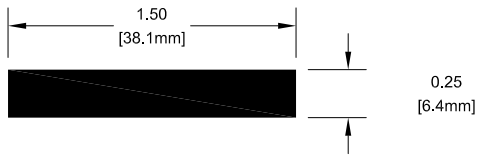
DO NOT REMOVE OR COVER THIS LABEL / NE PAS RETIRER OU COUVRIR CETTE ÉTIQUETTE

853939

5.50
[139.7mm]

12.00
[304.8mm]

SERIAL & DATE BOX DETAIL



TOLERANCES EXCEPT AS NOTED	HOLES ± .005"	DESCRIPTION SEE NOTE	SCALE 1:1	SIZE B	REV A	UNITED STATES STOVE COMPANY ESTABLISHED 1869	
	DECIMAL .XX = 0,03 XXX = 0,010	FINISH	DWN BY SEH	TITLE CERTIFICATION PLATE		NUMBER 853939	SHEET 1 OF 1
	ANGULAR ± 2°	REFERENCE KP5522, US5522	DATE 3/4/13				

LABELING VENDOR NOTES:

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

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

TEXT: ALL TEXT TO BE 0.07 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	3/21/22	GSC

1 INCH SQ. BORDER, LOGS AND FLAMES ARE TO BE RED

0.25 TEXT HEIGHT

0.125 TEXT HEIGHT

ATTENTION: 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.

ATTENTION: OPERATE THIS UNIT ONLY WITH THE FUEL HOPPER LID CLOSED. FAILURE TO DO SO MAY RESULT IN EMISSION OF PRODUCTS OF COMBUSTION FROM THE HOPPER UNDER CERTAIN CONDITIONS. MAINTAIN HOPPER SEAL IN GOOD CONDITION. DO NOT OVERFILL THE HOPPER.

CAUTION: Moving parts may cause injury. Do not operate with the side panels or repair panel removed. Do not place hands or fingers in the moving auger area at the bottom of the hopper. Do not obstruct the combustion air inlet opening at the rear of the appliance.
DANGER: Risk of electrical shock. Disconnect power before servicing unit. Route power supply cord away from the appliance.
Keep viewing and ash removal doors tightly closed during operation. Replace glass with 5mm ceramic glass ONLY.
IMPORTANT: When the hopper lid is open, the auger will stop. Close the hopper lid to allow system to operate. Provide a source of fresh air to the room where the appliance is installed. Do not obstruct the space beneath the appliance. Inspect and clean exhaust vent system frequently in accordance with manufacturer's instructions.
Install and use only in accordance with the manufacturer's installation and operating instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Do not install in a sleeping room.
Do not connect this unit to a chimney flue serving another appliance. Refer to local building codes and the installation and operating instructions for precautions required for passing an exhaust venting system through a combustible wall or ceiling.
Components required for residential or mobile home installation: Model PL Vent Chimney and Components - 3"/75mm or 4" 100mm diameter.
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 - Press the ON/OFF button. Green power light begins to blink. When the light becomes solid, set the desired heat level.
SHUT DOWN: Press the "OFF" button. Unit will shutdown automatically after fuel burns out and unit cools down.

ATTENTION: CHAUD PENDANT LE FONCTIONNEMENT-NE PAS TOUCHER MAINTENIR LES ENFANTS ET LES VÊTEMENTS ÉLOIGNÉS. TOUT CONTACT PEUT ENTRAÎNER DES BRÛLURES. CONSULTER LA PLAQUE SIGNALÉTIQUE ET LES INSTRUCTIONS. MAINTENIR LE MOBILIER ET LES AUTRES MATIÈRES COMBUSTIBLES À BONNE DISTANCE DE L'APPAREIL.

ATTENTION: FAIRE FONCTIONNER CETTE UNITÉ UNIQUEMENT AVEC LE COUVERCLE DE TRÉMIE DU COMBUSTIBLE FERMÉ. NES PAS LE FAIRE PEUT ENTRÎNER DES ÉMISSIONS DE PRODUITS DE LA TRÉMIE DANS CERTAINES CONDITIONS. D'ASSURER L'ÉTANCHÉITÉ TRÉMIE EN BON ETAT. NE PAS SURCHARGER LA TRÉMIE.

ATTENTION: Les pièces en mouvement peuvent provoquer des blessures. Ne pas faire fonctionner cette unité avec les panneaux latéraux ou le panneau arrière retirés. Ne pas placer les mains ou les doigts à l'intérieur de la zone de la vis sans fin en bas de la trémie. N'obstruez pas l'admission d'air de combustion.
DANGER: Risque de choc électrique. Déconnecter l'alimentation avant de réaliser l'entretien de l'unité. Faire passer le cordon d'alimentation à distance de l'unité.
Maintenir les portes d'inspection et de retrait des cendres bien fermées pendent le fonctionnement. Remplacer le verre uniquement par du verre céramique (5mm).
IMPORTANT: Quand le couvercle de la trémie est ouvert, la vis sans fin d'alimentation s'arrêtera. Fermer le couvercle pour permettre au système de fonctionner. Fournir une source d'air frais dans le chambre. Ne pas obsturer l'espace sous l'app. de chauffage. Inspecter et nettoer fréquemment le système de ventilation d'évacuation conformément aux instructions du fabricant.
Installer et utiliser conformément aux instructions du fabricant uniquement. Contacter les fonctionnaires locaux de construction ou fonctionnaires des services d'incendie concernant les limitations et l'inspection de l'installation dans votre maison. Ne pas installer dans une chambre à coucher.
Ne pas connecter cette unité à un carneau de chiminée utilisé pour un autre appareil. Consulter le code local de construction et les instructions du fabricant pour les précautions requises pour passer à travers un mur ou un plafond combustible.
Composants nécessaires pour une installation dans une résidence ou une maison mobile: Ventilation modèle PL chiminée et composants - Diamètre de 3"/75mm ou 4"/100mm.
Ce poêle à bois doit inspection et la réparation périodique. Pour un fonctionnement correct, consultez le manuel du propriétaire pour plus d'informations. Ce est contre les règlements fédéraux pour faire fonctionner ce poêle à bois d'une manière incompatible avec les instructions d'utilisation dans le manuel du propriétaire.
MISE en MARCHE / Allumage Automatique - Appuyer sur le buoton ON/OFF. Le voyant vert se met à clignoter. Lorsque le voyant s'arrête de clignoter et reste allumé, régler le thermostat au niveau souhaité.
ARRÊT: Placer le réglage de chaleur sur "OFF". L'unité s'éteindra automatiquement une fois que le combustible sera consumé et que l'unité ait refroidi.

0.10 TEXT HEIGHT

MODEL / MODÈLE : AP5622

TESTED TO/TESTÉ SELON: ASTM E1509-12 (2017), ULC-S627-00-REV1
Room Heater, Pellet Fuel-Burning Type, Also for Use in Mobile Homes. For use with wood pellet fuel only. Use of other fuels will void warranty.
Appareil de chauffage inséré de combustible solide/de type de boulettes. l'installation dans les maisons mobile. Pour Utilisation avec dec granulés uniquement! L'utilisation d'autres combustibles annulera la garantie.
INPUT RATING: 42,326 BTU/HR - ELECTRICAL RATING: 120V, 60Hz, 3A

ENVIRONMENTAL PROTECTION AGENCY
Certified to comply with 2020 particulate emission standards. Tested to ASTM E2779-10 & ASTM E2515-17 - 1.5 g/hr. 76% Efficiency

Serial No. / N° de série

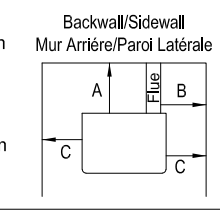
Manufacture Date. / Date de Fabrication

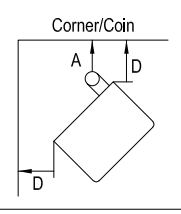
Report No. / Rapport N° F20-570

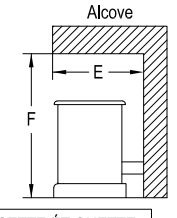
U.S. Stove Company • 227 Industrial Park Road • South Pittsburg, TN 37380 • Phone: (800) 750-2723 • Web: www.usstove.com

Clearances to Combustibles: Residential and Mobile Home
Dégagements Combustibles: Dans Une Résidence ou Une Maison Mobile

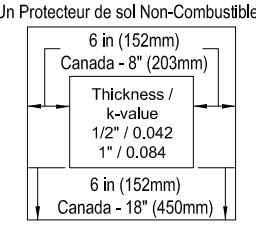
A - 2" / 50mm
B - 13" / 330mm
C - 8" / 203mm
D - 8" / 203mm
E - 36" / 914mm
F - 60" / 1.52M







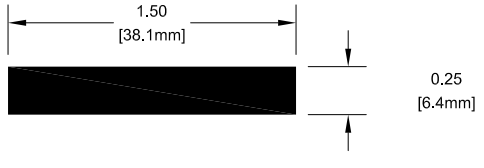
1/2"(12.5mm) or 1"(25mm) Thick/Épais Non-Combustible Floor Protection / Un Protecteur de sol Non-Combustible

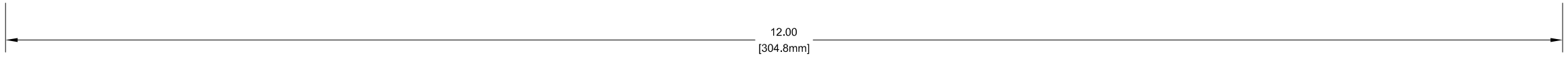


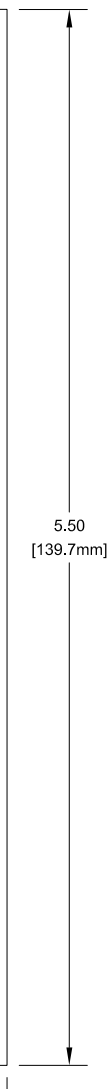
DO NOT REMOVE OR COVER THIS LABEL / NE PAS RETIRER OU COUVRIR CETTE ÉTIQUETTE

853940

SERIAL & DATE BOX DETAIL







TOLERANCES EXCEPT AS NOTED: HOLES ± .005" | DECIMAL .XX = 0,03 XXX = 0,010 | ANGULAR ± 2°

DESCRIPTION: SEE NOTE
FINISH:
REFERENCE: AP5622
SCALE: 1:1
DWN BY: SEH
DATE: 3/4/13
SIZE: B
REV: A

UNITED STATES STOVE COMPANY
ESTABLISHED 1869

TITLE: CERTIFICATION PLATE
NUMBER: 853940
SHEET: 1 OF 1

LABELING VENDOR NOTES:

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

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

TEXT: ALL TEXT TO BE 0.07 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	3/21/22	GSC

1 INCH SQ. BORDER, LOGS AND FLAMES ARE TO BE RED

0.25 TEXT HEIGHT

0.125 TEXT HEIGHT

ATTENTION: 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.

0.25 TEXT HEIGHT

0.125 TEXT HEIGHT

ATTENTION: OPERATE THIS UNIT ONLY WITH THE FUEL HOPPER LID CLOSED. FAILURE TO DO SO MAY RESULT IN EMISSION OF PRODUCTS OF COMBUSTION FROM THE HOPPER UNDER CERTAIN CONDITIONS. MAINTAIN HOPPER SEAL IN GOOD CONDITION. DO NOT OVERFILL THE HOPPER.

CAUTION: Moving parts may cause injury. Do not operate with the side panels or repair panel removed. Do not place hands or fingers in the moving auger area at the bottom of the hopper. Do not obstruct the combustion air inlet opening at the rear of the appliance.
DANGER: Risk of electrical shock. Disconnect power before servicing unit. Route power supply cord away from the appliance.
Keep viewing and ash removal doors tightly closed during operation. Replace glass with 5mm ceramic glass ONLY.
IMPORTANT: When the hopper lid is open, the auger will stop. Close the hopper lid to allow system to operate. Provide a source of fresh air to the room where the appliance is installed. Do not obstruct the space beneath the appliance. Inspect and clean exhaust vent system frequently in accordance with manufacturer's instructions.
Install and use only in accordance with the manufacturer's installation and operating instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Do not install in a sleeping room.
Do not connect this unit to a chimney flue serving another appliance. Refer to local building codes and the installation and operating instructions for precautions required for passing an exhaust venting system through a combustible wall or ceiling.
Components required for residential or mobile home installation: Model PL Vent Chimney and Components - 3"/75mm or 4" 100mm diameter.
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 - Press the ON/OFF button. Green power light begins to blink. When the light becomes solid, set the desired heat level.
SHUT DOWN: Press the "OFF" button. Unit will shutdown automatically after fuel burns out and unit cools down.

0.10 TEXT HEIGHT

MODEL / MODÈLE : VG5722

TESTED TO/TESTÉ SELON: ASTM E1509-12 (2017), ULC-S627-00-REV1
Room Heater, Pellet Fuel-Burning Type, Also for Use in Mobile Homes. For use with wood pellet fuel only. Use of other fuels will void warranty.
Appareil de chauffage inséré de combustible solide/de type de boulettes. l'installation dans les maisons mobile. Pour Utilisation avec dec granulés uniquement! L'utilisation d'autres combustibles annulera la garantie.
INPUT RATING: 42,326 BTU/HR - ELECTRICAL RATING: 120V, 60Hz, 3A

ENVIRONMENTAL PROTECTION AGENCY
Certified to comply with 2020 particulate emission standards. Tested to ASTM E2779-10 & ASTM E2515-17 - 1.5 g/hr. 76% Efficiency

Serial No. / N° de série

Manufacture Date. / Date de Fabrication

Report No. / Rapport N° F20-570

U.S. Stove Company • 227 Industrial Park Road • South Pittsburg, TN 37380 • Phone: (800) 750-2723 • Web: www.usstove.com

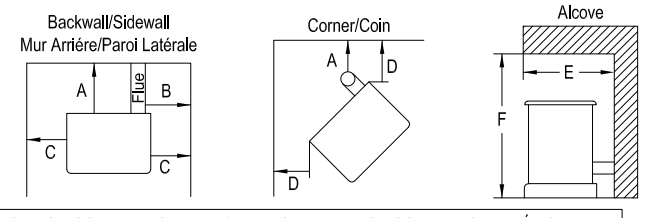
ATTENTION: CHAUD PENDANT LE FONCTIONNEMENT-NE PAS TOUCHER MAINTENIR LES ENFANTS ET LES VÊTEMENTS ÉLOIGNÉS. TOUT CONTACT PEUT ENTRAÎNER DES BRÛLURES. CONSULTER LA PLAQUE SIGNALÉTIQUE ET LES INSTRUCTIONS. MAINTENIR LE MOBILIER ET LES AUTRES MATIÈRES COMBUSTIBLES À BONNE DISTANCE DE L'APPAREIL.

ATTENTION: FAIRE FONCTIONNER CETTE UNITÉ UNIQUEMENT AVEC LE COUVERCLE DE TRÉMIE DU COMBUSTIBLE FERMÉ. NES PAS LE FAIRE PEUT ENTRÎNER DES ÉMISSIONS DE PRODUITS DE LA TRÉMIE DANS CERTAINES CONDITIONS. D'ASSURER L'ÉTANCHÉITÉ TRÉMIE EN BON ETAT. NE PAS SURCHARGER LA TRÉMIE.

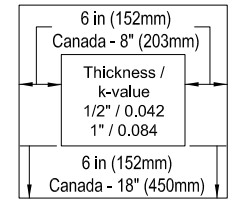
ATTENTION: Les pièces en mouvement peuvent provoquer des blessures. Ne pas faire fonctionner cette unité avec les panneaux latéraux ou le panneau arrière retirés. Ne pas placer les mains ou les doigts à l'intérieur de la zone de la vis sans fin en bas de la trémie. N'obstruez pas l'admission d'air de combustion.
DANGER: Risque de choc électrique. Déconnecter l'alimentation avant de réaliser l'entretien de l'unité. Faire passer le cordon d'alimentation à distance de l'unité.
Maintenir les portes d'inspection et de retrait des cendres bien fermées pendent le fonctionnement. Remplacer le verre uniquement par du verre céramique (5mm).
IMPORTANT: Quand le couvercle de la trémie est ouvert, la vis sans fin d'alimentation s'arrêtera. Fermer le couvercle pour permettre au système de fonctionner. Fournir une source d'air frais dans le chambre. Ne pas obsturer l'espace sous l'app. de chauffage. Inspecter et nettoer fréquemment le système de ventilation d'évacuation conformément aux instructions du fabricant.
Installer et utiliser conformément aux instructions du fabricant uniquement. Contacter les fonctionnaires locaux de construction ou fonctionnaires des services d'incendie concernant les limitations et l'inspection de l'installation dans votre maison. Ne pas installer dans une chambre à coucher.
Ne pas connecter cette unité à un carneau de chiminée utilisé pour un autre appareil. Consulter le code local de construction et les instructions du fabricant pour les précautions requises pour passer à travers un mur ou un plafond combustible.
Composants nécessaires pour une installation dans une résidence ou une maison mobile: Ventilation modèle PL chiminée et composants - Diamètre de 3"/75mm ou 4"/100mm.
Ce poêle à bois doit inspection et la réparation périodique. Pour un fonctionnement correct, consultez le manuel du propriétaire pour plus d'informations. Ce est contre les règlements fédéraux pour faire fonctionner ce poêle à bois d'une manière incompatible avec les instructions d'utilisation dans le manuel du propriétaire.
MISE en MARCHE / Allumage Automatique - Appuyer sur le buoton ON/OFF. Le voyant vert se met à clignoter. Lorsque le voyant s'arrête de clignoter et reste allumé, régler le thermostat au niveau souhaité.
ARRÊT: Placer le réglage de chaleur sur "OFF". L'unité s'éteindra automatiquement une fois que le combustible sera consumé et que l'unité ait refroidi.

Clearances to Combustibles: Residential and Mobile Home
Dégagements Combustibles: Dans Une Résidence ou Une Maison Mobile

A - 2" / 50mm
B - 13" / 330mm
C - 8" / 203mm
D - 8" / 203mm
E - 36" / 914mm
F - 60" / 1.52M



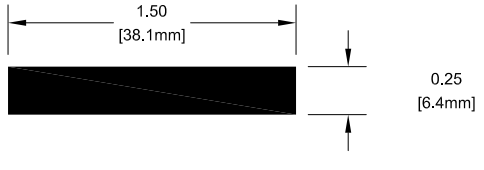
1/2"(12.5mm) or 1"(25mm) Thick/Épais Non-Combustible Floor Protection / Un Protecteur de sol Non-Combustible

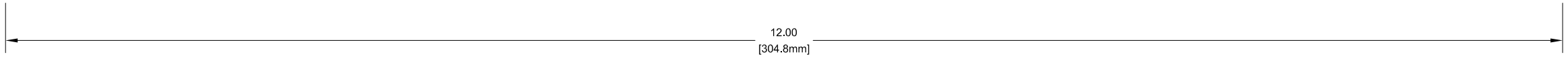


DO NOT REMOVE OR COVER THIS LABEL / NE PAS RETIRER OU COUVRIR CETTE ÉTIQUETTE

853941

SERIAL & DATE BOX DETAIL





5.50
[139.7mm]

TOLERANCES EXCEPT AS NOTED: HOLES ± .005" | DECIMAL .XX = 0,03 XXX = 0,010 | ANGULAR ± 2°

DESCRIPTION: SEE NOTE
FINISH:
REFERENCE: VG5722
SCALE: 1:1
DWN BY: SEH
DATE: 3/4/13
SIZE: B
REV: A

UNITED STATES STOVE COMPANY
ESTABLISHED 1869

TITLE: CERTIFICATION PLATE
NUMBER: 853941
SHEET: 1 OF 1

Appendix C

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-50-DIR
Lab ID #:	129
Serial #:	1906005
Calibration Date:	10/5/2021
Calibration Expiration:	4/5/2022
Barometric Pressure:	29.71 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/22/2022
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	3/15/2021
γ Factor:	1.003
Allowable Deviation (±5%):	0.05015
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	238.758	169.548	155.082
Standard DGM Temperature (°F)	66.0	66.0	66.0
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)	8.510	6.105	5.596
DGM Temperature (°F)	74.0	75.0	75.0
DGM Pressure (in H_2O)	2.55	1.08	0.7
Time (min)	32.0	39.0	47.0
Net Volume for Standard DGM (ft^3)	8.432	5.988	5.477
Net Volume for DGM (ft^3)	8.510	6.105	5.596

Dry Gas Meter γ Factor	0.998	0.993	0.992
γ Factor Deviation From Average	0.998	0.993	0.992

Average Gas Meter γ Factor: 0.994

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:

Pressure Gauge Calibration Work Sheet

Gauge Manufacturer:	Apex
Maximum Range (inH_2O):	3
Instrument ID #:	129 (dH)
Calibration Date:	10/7/2021
Calibration Expiration:	10/7/2022
Barometric Pressure:	30.03 in. Hg

Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	477AV-1
Instrument ID#:	174
Calibration Expiration Date:	10/8/2021

Calibration Point (inH_2O)	Reference Gauge Reading (inH2O)	Pressure Gauge Reading (inH2O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.6	0.54	0.54	0	0.0%
0.6 - 1.2	0.90	0.91	0.01	0.3%
1.2 - 1.8	1.56	1.57	0.01	0.3%
1.8 - 2.4	1.94	1.97	0.03	1.0%
2.4 - 3.0	2.68	2.72	0.04	1.3%

Acceptable tolerance is 4%

Technican Signature: _____ Date: 10/7/2021

Uncertainty is 0.4 inH_2O, based on minumum uncertainity ration of 4:1 between standard reference meter and unit under test.

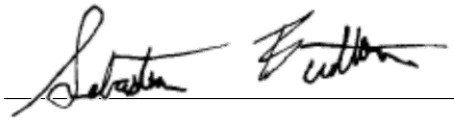
Pressure Gauge Calibration Work Sheet

Gauge Manufacturer:	Apex
Maximum Range (inH_2O):	1
Instrument ID #:	129 (dP)
Calibration Date:	10/7/2021
Calibration Expiration:	10/7/2022
Barometric Pressure:	30.03 in. Hg

Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	475
Instrument ID#:	76
Calibration Expiration Date:	8/3/2022

Calibration Point (inH_2O)	Reference Gauge Reading (inH2O)	Pressure Gauge Reading (inH2O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.2	0.17	0.17	0	0.0%
0.2 - 0.4	0.36	0.36	0	0.0%
0.4 - 0.6	0.51	0.51	0	0.0%
0.6 - 0.8	0.63	0.63	0	0.0%
0.8 - 1.0	0.98	0.98	0	0.0%

Acceptable tolerance is 4%

Technican Signature:  Date: 10/7/2021

Uncertainty is 0.4 inH_2O, based on minumum uncertainity ration of 4:1 between standard reference meter and unit under test.

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-50-DIR
Lab ID #:	130
Serial #:	1906006
Calibration Date:	10/5/2021
Calibration Expiration:	4/5/2022
Barometric Pressure:	29.71 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/22/2022
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	3/15/2021
γ Factor:	0.999
Allowable Deviation (±5%):	0.04995
Actual Deviation:	0.003
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)	144.926	150.142	211.619
Standard DGM Temperature (°F)	66.0	66.0	66.0
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)	5.095	5.298	7.439
DGM Temperature (°F)	68.0	68.0	68.0
DGM Pressure (in H_2O)	1.12	0.70	2.0
Time (min)	34.0	49.0	33.0
Net Volume for Standard DGM (ft^3)	5.118	5.302	7.473
Net Volume for DGM (ft^3)	5.095	5.298	7.439

Dry Gas Meter γ Factor	1.004	1.001	1.001
γ Factor Deviation From Average	1.004	1.001	1.001

Average Gas Meter γ Factor: 1.002

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:

Pressure Gauge Calibration Work Sheet

Gauge Manufacturer:	Apex
Maximum Range (inH_2O):	3
Instrument ID #:	130 (dH)
Calibration Date:	10/7/2021
Calibration Expiration:	10/7/2022
Barometric Pressure:	30.03 in. Hg

Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	477AV-1
Instrument ID#:	174
Calibration Expiration Date:	10/8/2021

Calibration Point (inH_2O)	Reference Gauge Reading (inH2O)	Pressure Gauge Reading (inH2O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.6	0.53	0.53	0	0.0%
0.6 - 1.2	1.06	1.06	0	0.0%
1.2 - 1.8	1.43	1.43	0	0.0%
1.8 - 2.4	1.95	1.97	0.02	0.7%
2.4 - 3.0	2.64	2.67	0.03	1.0%

Acceptable tolerance is 4%

Technican Signature: _____ Date: 10/7/2021

Uncertainty is 0.4 inH_2O, based on minumum uncertainity ration of 4:1 between standard reference meter and unit under test.

Pressure Gauge Calibration Work Sheet

Gauge Manufacturer:	Apex
Maximum Range (inH_2O):	1
Instrument ID #:	130 (dP)
Calibration Date:	10/7/2021
Calibration Expiration:	10/7/2022
Barometric Pressure:	30.03 in. Hg

Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	475
Instrument ID#:	76
Calibration Expiration Date:	8/3/2022

Calibration Point (inH_2O)	Reference Gauge Reading (inH2O)	Pressure Gauge Reading (inH2O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.2	0.178	0.180	0.002	0.2%
0.2 - 0.4	0.371	0.386	0.015	1.5%
0.4 - 0.6	0.558	0.562	0.004	0.4%
0.6 - 0.8	0.675	0.680	0.005	0.5%
0.8 - 1.0	0.922	0.917	0.005	0.5%

Acceptable tolerance is 4%

Technican Signature: _____ Date: 10/7/2021

Uncertainty is 0.4 inH_2O, based on minumum uncertainity ration of 4:1 between standard reference meter and unit under test.

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	Apex-AK-600
Lab ID #:	55
Serial #:	810016
Calibration Date:	10/8/2021
Calibration Expiration:	10/8/2022
Barometric Pressure:	29.91 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/22/2022
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	3/31/2021
γ Factor:	1.010
Allowable Deviation (±5%):	0.0505
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	152.577	230.297	211.876
Standard DGM Temperature (°F)	68.0	68.0	68.0
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)	5.384	8.132	7.488
DGM Temperature (°F)	70.0	70.0	70.0
DGM Pressure (in H_2O)	2.14	2.14	2.1
Time (min)	28.0	42.0	39.0
Net Volume for Standard DGM (ft^3)	5.388	8.133	7.482
Net Volume for DGM (ft^3)	5.384	8.132	7.488

Dry Gas Meter γ Factor	0.997	0.997	0.996
γ Factor Deviation From Average	0.997	0.997	0.996

Average Gas Meter γ Factor: 0.997

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

CERTIFICATE OF CALIBRATION

CUSTOMER:	**PFS-TECO :** CLACKAMAS, OR	**CALIBRATION DATE:**	05/25/2021
PO NUMBER:	1047	**CALIBRATION DUE:**	05/25/2022
INST. MANUFACTURER:	DWYER	**PROCEDURE:**	T.O.33K6-4-1769-1
INST. DESCRIPTION:	VELOMETER	**CALIBRATION FLUID:**	AIR @ 14.7 PSIA 70°F
MODEL NUMBER:	471	**RECEIVED CONDITION:**	WITHIN MFG. SPECS.
SERIAL NUMBER:	CP288559 (ID# 095)	**LEFT CONDITION:**	WITHIN MFG. SPECS.
RATED ACCURACY:	SEE NOTES BELOW.	**AMBIENT CONDITIONS:**	763mm HGA 49% RH 72°F
UNCERTAINTY GIVEN:	± 0.43% RD ; k=2	**CERTIFICATE FILE #:**	490265.2021

NOTES: ± 3% FS (0-500 / 0-1500) *** ± 4% F.S. (0-5000) ***± 5% F.S. (0-15000) *** ± 2 °F

Q.MANUAL IM 1.5 REV 2017.1 DATED 7-18-2017 ** DECISION RULE : NO PFA%**

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM STD. ACTUAL DEG. F
53	55	0 TO 200°F	0 TO 200°F
118	120	45.1	44.3
244	249	70.6	69.9
493	503	100.3	99.8
517	522		
1062	1076		
1494	1517		
560	565		
3129	3164		
4996	5082		
6251	6374		
14829	15148		

STANDARDS USED:		
A220: 12" WIND TUNNEL 0 - 8000 FPM | CMC ± 0.203% RD | TRACE# 1329407628	DUE	02/18/2022
A800: FLOW-DYNE SONIC NOZZLE SYSTEM | 0 – 1086 CFM ± 0.46% RD. | TRACE# 1329407628, 89576, 152043238	DUE	01/26/2022

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) and the Unit Under Test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed according to the shown procedure. The use of IAS/ILAC logo indicates calibrations are in accordance to ISO/IEC 17025:2017.

Dick Munns Company · 11133 Winners Circle, Los Alamitos, CA 90720
Phone: 714-827-1215 · www.dickmunns.com

Issuing Date: 05/25/2021 Approved By: Cristian Lima Cal. Technician: D. C.

Calibrated at: ✓ Lab
__ On-Site (Customer's)

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

ACCREDITED
Calibration Services
Certificate Number: 1550.01
Laboratory code: 115953

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

Report Number: DIRI0134307497210625

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	6/25/21	12/8/20	6/2022

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. 99.9999	9. 99.9999
2. 99.9999	6. 99.9999	10. 100.0000
3. 99.9999	7. 100.0000	**Result**
4. 99.9999	8. 100.0000	0.00004

ENVIRONMENTAL CONDITIONS
☑ Good ☐ Fair ☐ Poor
Temperature: 22.1°C

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9995	200.0000	0.00016
100	99.9999	100.0000	0.00016
50	50.0002	50.0000	0.00015
20	20.0000	20.0000	0.00015
1	.9999	.9999	0.00015
0.1	.0999	.0999	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	4/30/21	4/2022	20210012

Permanent Information Concerning this Equipment:
6 month calibration cycle
12/20 Extra checkpoint to encapsulate user range 0.05g.
AF= 0.0499g A/L= 0.0500

Comments/Info Concerning this Calibration:
6/21: RH 44.7%

Report prepared/reviewed by: R.B. **Date:** 6-25-21 **Technician:** K. Dexter
Signature: Kyle Dexter

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation and readability of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

Certificate of Calibration

Certificate Number: **743897**

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: **1033**
Order Date: **03/08/2021**
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: **03/18/2021**
*Recommended Due: **03/18/2022**
Environment: **22** °C **37** % RH
* As Received: **Within Tolerance**
* As Returned: **Within Tolerance**
Action Taken: **Calibrated w/Parts**
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.

Replaced batteries.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
644A	Thunder Scientific	1200	Two Pressure Humidity Generator	11/17/2021	734190
847A	Fluke	RPM4	Reference Pressure Monitor	12/30/2021	738139

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	*Error	UUT	Uncertainty Accredited = ü
Before/After							
Temperature							
	℃	20.00	19.0	21.0	0.1	20.1 ℃	8.1E-02 ü
	℃	30.00	29.0	31.0	0.2	30.2 ℃	8.1E-02 ü
	℃	40.00	39.0	41.0	0.7	39.3 ℃	8.1E-02 ü
Barometer							
	mbar	1013.0	1005	1021	8	1005 mbar	6.2E-01 ü

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without written approval of JJ Calibrations.

Reviewer

3 Issued 03/25/2021 Rev # 15

Inspector

PRAXAIR
Making our planet more productive

DocNumber: 271681

Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22019

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062-9547

Certificate Issuance Date: 10/16/2019
Praxair Order Number: 71120745
Part Number: NI CD17CO8E-AS
Customer PO Number: 79106732

Fill Date: 10/07/2019
Lot Number: 70086928009
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 1300 psig 99 ft3

Certified Concentration

ProSpec EZ Cert

Expiration Date:	10/16/2027	NIST Traceable
Cylinder Number:	CC106574	Expanded Uncertainty
17.00 %	Carbon dioxide	± 0.5 %
4.31 %	Carbon monoxide	± 0.6 %
16.95 %	Oxygen	± 0.2 %
Balance	Nitrogen	

Certification Information:

Certification Date: 10/16/2019 Term: 96 Months Expiration Date: 10/16/2027

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, 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: 09/18/2019

First Analysis Data:						Date	10/16/2019
Z:	0	R:	19.98	C:	17	Conc:	17
R:	19.98	Z:	0	C:	17	Conc:	17
Z:	0	C:	17.01	R:	19.99	Conc:	17.01
UOM:	%			Mean Test Assay:		17	%

Reference Standard: Type / Cylinder #: GMIS / CC149981
Concentration / Uncertainty: 19.98 % ±0.279%
Expiration Date: 06/07/2026
Traceable to: SRM # / Sample # / Cylinder #: RGM#CC28033 / N/A / RGM#CC28033
SRM Concentration / Uncertainty: 19.67% / ±0.04%
SRM Expiration Date: 07/15/2021

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:			%

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: 09/19/2019

First Analysis Data:						Date	10/16/2019
Z:	0	R:	5	C:	4.31	Conc:	4.31
R:	5	Z:	0	C:	4.31	Conc:	4.31
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: 16.95 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 09/18/2019

First Analysis Data:						Date	10/16/2019
Z:	0	R:	20.88	C:	16.96	Conc:	16.95
R:	20.88	Z:	0	C:	16.96	Conc:	16.95
Z:	0	C:	16.97	R:	20.9	Conc:	16.96
UOM:	%			Mean Test Assay:		16.95	%

Reference Standard: Type / Cylinder #: GMIS / CC506521
Concentration / Uncertainty: 20.87 % ±0.108%
Expiration Date: 12/14/2026
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: Jenna Lockman

PRAXAIR
Making our planet more productive

DocNumber: 271687

Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22019

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062-9547

Certificate Issuance Date: 10/16/2019
Praxair Order Number: 71120745
Part Number: NI CD10CO33E-AS
Customer PO Number: 79106732

Fill Date: 10/08/2019
Lot Number: 70086928102
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

ProSpec EZ Cert

Expiration Date: 10/16/2027		Cylinder Number: CC139173	NIST Traceable Expanded Uncertainty
10.09 %	Carbon dioxide		± 0.4 %
2.53 %	Carbon monoxide		± 0.6 %
10.48 %	Oxygen		± 0.4 %
Balance	Nitrogen		

Certification Information:

Certification Date: 10/16/2019 Term: 96 Months Expiration Date: 10/16/2027

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, 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: 10 %
Certified Concentration: 10.09 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 09/18/2019

First Analysis Data:						Date	10/16/2019
Z:	0	R:	14	C:	10.09	Conc:	10.09
R:	14	Z:	0	C:	10.1	Conc:	10.1
Z:	0	C:	10.1	R:	14.01	Conc:	10.1
UOM:	%				Mean Test Assay:		10.09 %

Reference Standard: Type / Cylinder #: GMIS / CC164230
Concentration / Uncertainty: 14.00 % ±0.265%
Expiration Date: 04/16/2027
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: 2.53 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 09/19/2019

First Analysis Data:						Date	10/16/2019
Z:	0	R:	5	C:	2.53	Conc:	2.53
R:	5	Z:	0	C:	2.53	Conc:	2.53
Z:	0	C:	2.54	R:	5.01	Conc:	2.54
UOM:	%				Mean Test Assay:		2.53 %

Reference Standard: Type / Cylinder #: 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: 10.5 %
Certified Concentration: 10.48 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 09/18/2019

First Analysis Data:						Date	10/16/2019
Z:	0	R:	9.88	C:	10.49	Conc:	10.48
R:	9.88	Z:	0	C:	10.49	Conc:	10.48
Z:	0	C:	10.5	R:	9.89	Conc:	10.49
UOM:	%				Mean Test Assay:		10.48 %

Reference Standard: Type / Cylinder #: NTRM / DT0010384
Concentration / Uncertainty: 9.875 % ±0.4%
Expiration Date: 11/18/2022
Traceable to: SRM # / Sample # / Cylinder #: NTRM / 170701 / NTRM DT0010384
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: Jose Vasquez

Certified By: Jenna Lockman

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.

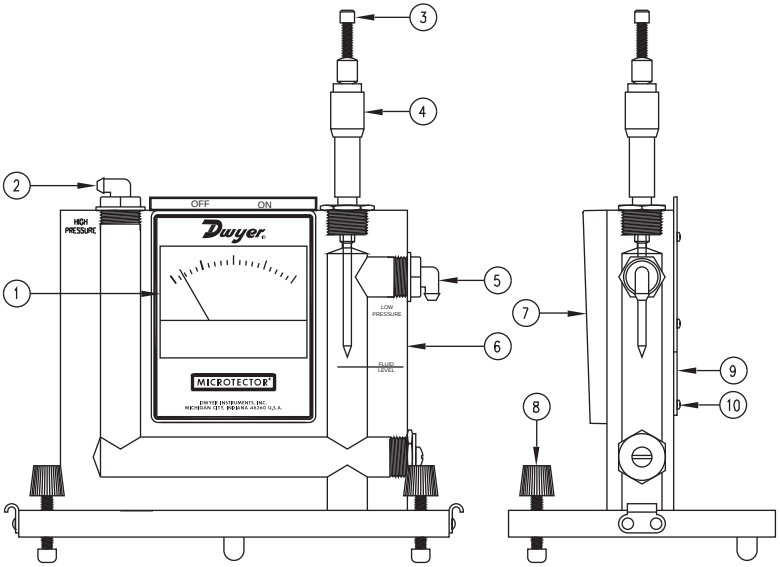
SPECIFICATIONS AND FEATURES

- 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



Microtector® Gage

Precision Pressure Measurement

The Microtector® Gage combines the time-proven principles of the Hook Gage type manometer and modern solid-state integrated circuit electronics. It provides an inexpensive means of achieving accuracy and repeatability within ± .00025 inches water column throughout its 0 to 2 inches w.c. range. It is truly a new standard in precision measuring devices.

Principles of Operation

A pressure to be measured is applied to the manometer fluid which is displaced in each leg of the manometer by an amount equal to 1/2 the applied pressure. A micrometer mounted point is then lowered until it contacts the manometer gage fluid. The instant of contact is detected by completion of a low-power A.C. circuit. Current for this circuit is supplied by a 1.5 volt penlight cell feeding two semiconductor amplifiers which act as a free-running multivibrator operating at a frequency of approximately two kilohertz. Completion of the A.C. circuit activates a bridge rectifier which provides the signal for indication on a sensitive (0 to 50 microamps) D.C. microammeter.

On indication of contact, the operator stops lowering the point and reads the micrometer which indicates one half the applied pressure. By interpolating eight divisions (each being .000125″ w.c.) between .001 micrometer graduations, a total accuracy of .00025 can easily be achieved. The micrometer complies with Federal Specification GGG-C-105A and is traceable to a master at the NIST.

Locating and Opening

Stand the Microtector® Gage and case on a firm flat level surface. Remove cover by releasing the latches and lifting it straight up. If it is necessary to move the gage without case, handle only the base plate or clear acrylic block. (**CAUTION:** Do not handle gage by grasping meter-electronic package housing Item 7 on drawing.)

Fluid Level

Level the gage by adjusting the two front leveling screws (Item 8 on drawing) until the bubble in the spirit level is centered in the small circle. After leveling the gage, open both rapid shut-off valve tube connectors (Items 2 and 5). Back off the micrometer (Item 4), if necessary, to make sure that the point is not immersed in the gage fluid. The fluid level in the gage should now coincide with the mark on the right hand bore (Item 6) plus or minus approximately 1/32 inch. If the level of fluid is too high, fluid can be removed with an eye dropper pipette or carefully poured out of the right connection (Item 5).

If the level is too low, remove the top left rapid shut-off valve tube connector (Item 2) and add distilled water pre-mixed with the proper amount of green concentrate. (See maintenance instructions for proportions. After correcting the fluid level, re-install the rapid shut-off connectors and, with these in the open position, re-level the Microtector® Gage. The gage is now ready to be zeroed.

Zeroing

Turn the Micrometer barrel (Item 4) until its lower end just coincides with the zero mark on the scale and the zero on the barrel scale coincides with the vertical line on the internal scale. Note that the internal scale is graduated every .025″ from 0 to 1.00 inch and the barrel scale is graduated in one thousandths from 0 to .025″. Turn the meter circuit switch at the top of gage to the “on” position. While holding the barrel at the zero position (and with gage level), raise or lower the point by turning the knurled knob (Item 3) until the point is above, but near, the fluid.

Check to be sure that the meter registers zero. Watch the meter, hold the barrel, and lower the point slowly by turning the top knurled knob. As the knob is turned, the point will contact the fluid and the meter pointer will move from zero to some upscale position.

After making contact, turn the point out of the fluid by turning the micrometer barrel counterclockwise to a reading of .010 or more. Again, watch the meter and, this time, lower the point by turning the micrometer barrel. The point position where the meter pointer begins to move up scale is the zero position. This position should correspond to the zero reading on the micrometer. Adjust the point in relation to the micrometer barrel by turning the top knob while holding the barrel steady. Repeat lowering the point, watching the meter for contact, and adjusting the point until the zero position and zero reading exactly coincide. The gage is now zeroed and should not be moved.

An alternative method of zeroing and reading can be used wherein, instead of zeroing the gage completely, a zero correction reading is taken and recorded, then subtracted from the final reading. Comparable results can be obtained with either method.

Positive Pressure Measurement

With the fluid at its proper level, a pressure of 2.0″ water column maximum can be measured. Positive pressure should be applied to the top left connection (Item 2) with the micrometer zeroed as described above. This will permit a simple direct reading to be taken.

After an unknown pressure has been applied at the top left connection, the fluid level will drop in the left bore and rise over the point in the right bore. Note that the indicating meter point has moved upscale because the point is immersed in the fluid. Turn the micrometer counter-clockwise until the point leaves the fluid as indicated by the meter pointer dropping to zero on its scale. Then slowly turn the micrometer down until its point just touches the fluid surface, causing movement of the meter pointer. Withdraw the point and repeat several times, noting each time the micrometer reading where the meter pointer begins. The average of these readings multiplied by two is the pressure applied to the gage. (Avg. reading x 2 = pressure applied in inches w.c. The degree of uncertainty for the operator is indicated by the difference in these readings.

When the readings are complete, the pressure should be removed and the zero setting of Microtector® Gage rechecked. Any change in the zero position will indicate inaccurate readings. Should this happen, the zero-set and pressure measurement procedure should be repeated.

Negative Pressure or Vacuum Measurement

Zero the gage. Connect the source of vacuum or negative pressure to the right-side gage connection (Item 5) and proceed as described under Positive Pressure Measurement section. Remember that the pressure measured in this way is negative.

Differential Pressure Measurement

Differential pressures may be measured by connecting the higher (more positive) pressure to the left connection (Item 2) and the lower pressure to the right connection (Item 5).

Storage

Turn meter circuit switch to "off" position and withdraw the point well clear of fluid (by turning micrometer clockwise) when gage is not in use. This will conserve the batteries and minimize build-up of oxides, etc., on the point. Keep the unit covered and in an area free of strong solvent fumes.

Maintenance

When the meter reading becomes reduced or the pointer movement gets sluggish (with the circuit on and the point in fluid), the following should be done:

(1) Remove the point (by unscrewing) and clean the tip lightly using fine crocus cloth. Wipe off all grit and dirt with a clean rag; reassemble and recheck meter operation.

(2) If the meter operation continues to be sluggish, replace the size AA, 1.5 volt battery. (Replace the battery at least once a year to avoid deterioration of battery and damage to gage. Leakproof alkaline battery is recommended.)

To replace the battery, remove center screw (Item 10) located in the back of the electronic enclosure. Cover (Item 9) will come off, exposing the battery. Pull the old battery out and push a new battery into the battery holder with the positive (center) terminal to the right (to the end marked with + on the holder).

If the fluid becomes contaminated and requires replacement: empty old fluid from gage; flush out with clear water and replace with distilled water and A-126 fluorescein green color concentrate mixed with 3/4 oz. concentrate to each quart of water.

CAUTION:

1. Do not substitute other gage fluids, as proper gage operation depends on use of the specified gage fluid to provide proper surface tension, wetting ability and electrolyte capability with unity specific gravity.

If the gage bore is very dirty, a mild soap solution may be used to aid in cleaning prior to flushing with clear water.

2. Do not clean with liquid soaps, special solvent, de-greasers, aromatic hydrocarbons, etc. Such cleaners and solvents may contain chlorine, fluorine, acetone and related compounds that will permanently damage the gage and prevent proper operation.

Printed in U.S.A. 7/09 FR# 38-440190-00 Rev. 8

DWYER INSTRUMENTS, INC.
P.O. BOX 373
MICHIGAN CITY, INDIANA 46361,U.S.A
Phone: 219/879-8000 **www.dwyer-inst.com**
Fax: 219/872-9057 **e-mail: info@dwyer-inst.com**

Certificate of Calibration

Certificate Number: 743892

JJ Calibrations, Inc.
7724 SE Aspen Summit Drive
Portland, OR 97266-9217
Phone 503.786.3005
FAX 503.786.2994

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

0723.01
Calibration

PO: 1033
Order Date: 03/08/2021
Authorized By: N/A

Property #: 097
User: N/A
Department: N/A
Make: Unknown
Model: 10 Lbs.
Serial #: 097
Description: Mass
Procedure: DCN 500901
Accuracy: Raw Data

Calibrated on: 03/18/2021
*Recommended Due: 03/18/2026
Environment: 19 °C 41 % RH
* As Received: Other - See Remarks
* As Returned: Other - See Remarks
Action Taken: Calibrated
Technician: 126

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Data is provided for your determination of acceptability. Received/returned without accessories.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
484A	Rice Lake	1kg-10kg (Class ASTM 1)	Mass Set,	05/28/2021	699197
503A	Rice Lake	1mg-200g (Class 0)	Mass Set,	09/11/2021	729241
550A	And (A&D) Co.	HP-30K	Balance 30 Kg	12/31/2021	739307
723A	Rice Lake	1mg-200g (Class 0)	Mass Set,	06/09/2021	723431

Measurement Data

Parameter / Measurement Description	Range	Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After								Accredited = ü
Mass								
Raw Data		g	4535.92370000	0.0000000	0.0000000	0.1785299	4536.1022299 g	3.5E-01 ü

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without written approval of JJ Calibrations.

Reviewer

3 Issued 03/25/2021 Rev # 15

Inspector

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS

2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293

(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

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

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS

2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293

(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

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

Calibration Certificate ID
072731-240-041621-ACC-USI

Mettler Toledo
Service Business Unit Industrial
1900 Polaris Parkway
Columbus, OH 43240
1-800-523-5123

METTLER TOLEDO

Accredited by the American Association for Laboratory Accreditation (A2LA)
CALIBRATION CERT #1902.01

ISO 17025 Registered
ANSI/NCSL Z540-1 Accredited

Accuracy Calibration Certificate

Customer

Company:	PFS-TECO		
Address:	11785 SE Hwy 212; Ste 305		
City:	Clackamas	**Contact:**	John Steinert
Zip / Postal:	97015-9050		
State / Province:	Oregon		

Weighing Device

Manufacturer:	Mettler Toledo	**Instrument Type:**	Weighing Instrument
Model:	PFD774-US11	**Asset Number:**	2
Serial No.:	C112381343	**Terminal Model:**	IND570
Building:	N/A	**Terminal Serial No.:**	C101887029
Floor:	N/A	**Terminal Asset No.:**	N/A
Room:	N/A		

Range	Max. Capacity	Readability (d)
1	1000 lb	0.02 lb

Procedure

Calibration Guideline: ASTM E898 - 20
METTLER TOLEDO Work Instruction: 30260953

This calibration certificate including procedures and uncertainty estimation also complies with EURAMET cg-18 v 4.0.

This calibration certificate contains measurements for As Found and As Left calibrations.

The sensitivity/span of the weighing instrument was adjusted before As Left calibration with an external weight.

	Temperature		Humidity	
As Found	Start: 20.0 °C	End: 20.0 °C	Start: 28.0 %	End: 28.0 %
As Left	Start: 20.0 °C	End: 20.0 °C	Start: 28.0 %	End: 28.0 %

Environmental conditions have been verified to ensure the accuracy of the calibration.

This certificate is issued in accordance with the conditions of accreditation granted by A2LA, which is based on ISO/IEC 17025. A2LA has assessed the measurement capability of the laboratory and its traceability to recognized national standards.

As Found Calibration Date:	16-Apr-2021	**Authorized A2LA Signatory:**	Gary Sargent
As Left Calibration Date:	16-Apr-2021		
Issue Date:	16-Apr-2021		
Requested Next Calibration Date:	30-Apr-2022		

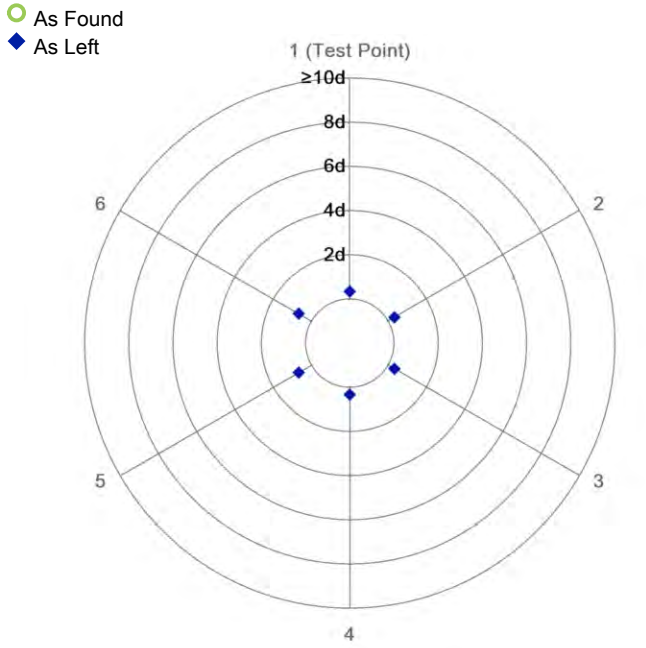
Measurement Results

Repeatability

Test Load: 500 lb

	As Found	As Left
1	N/A	500.00 lb
2	N/A	500.00 lb
3	N/A	500.00 lb
4	N/A	500.00 lb
5	N/A	500.02 lb
6	N/A	500.02 lb

Standard Deviation	**N/A**	**0.010 lb**



The "d" in the graph represents the readability of the range/interval in which the test was performed.

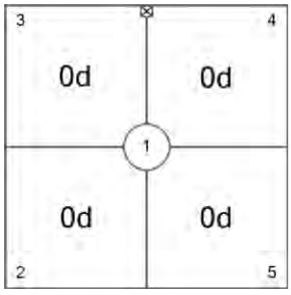
The results of this graph are based upon the absolute values of the differences from the mean value.

Eccentricity

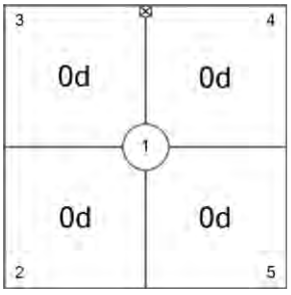
Test Load: 325 lb

Position	As Found	As Left
1	325.00 lb	325.00 lb
2	325.00 lb	325.00 lb
3	325.00 lb	325.00 lb
4	325.00 lb	325.00 lb
5	325.00 lb	325.00 lb

Maximum Deviation	**0.00 lb**	**0.00 lb**



As Found



As Left

The "d" in the graph represents the readability of the range/interval in which the test was performed.

Error of Indication

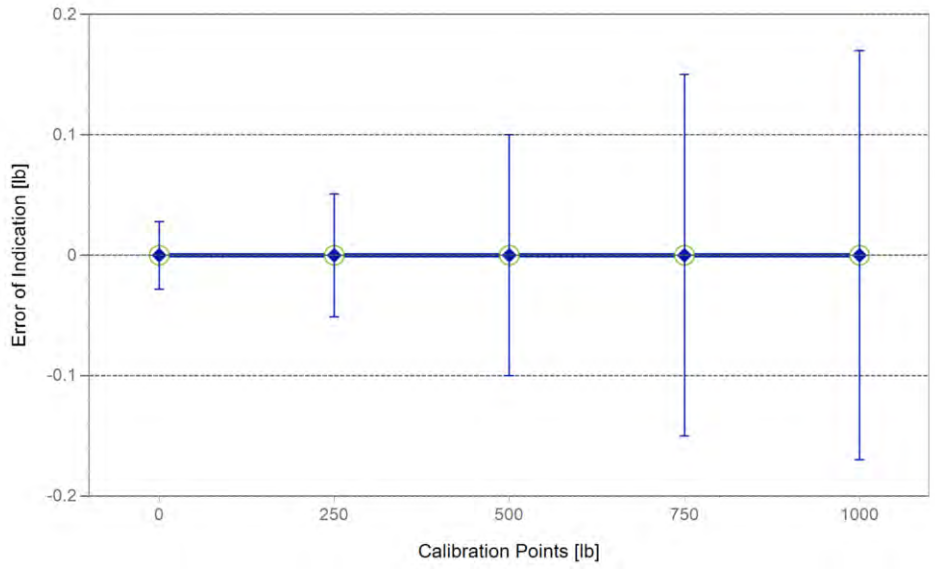
As Found

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0 lb	0.00 lb	0.00 lb	N/A	N/A
2 [1]	250 lb	250.00 lb	0.00 lb	N/A	N/A
3 [1]	500 lb	500.00 lb	0.00 lb	N/A	N/A
4 [1]	750 lb	750.00 lb	0.00 lb	N/A	N/A
5	1000 lb	1000.00 lb	0.00 lb	N/A	N/A
6 [1]	750 lb	750.00 lb	0.00 lb	N/A	N/A
7 [1]	500 lb	500.00 lb	0.00 lb	N/A	N/A
8 [1]	250 lb	250.00 lb	0.00 lb	N/A	N/A
9	0 lb	0.00 lb	0.00 lb	N/A	N/A

As Left

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0 lb	0.00 lb	0.00 lb	0.028 lb	2.37
2 [1]	250 lb	250.00 lb	0.00 lb	0.051 lb	2
3 [1]	500 lb	500.00 lb	0.00 lb	0.10 lb	2
4 [1]	750 lb	750.00 lb	0.00 lb	0.15 lb	2
5	1000 lb	1000.00 lb	0.00 lb	0.17 lb	2.05
6 [1]	750 lb	750.00 lb	0.00 lb	0.15 lb	2
7 [1]	500 lb	500.00 lb	0.00 lb	0.10 lb	2
8 [1]	250 lb	250.00 lb	0.00 lb	0.051 lb	2
9	0 lb	0.00 lb	0.00 lb	0.028 lb	2.37

[1]The calculated uncertainty was replaced by the CMC (Calibration and Measurement Capabilities) value because the calculated uncertainty was smaller than the CMC value.



As Found

As Left

For improved legibility of the graphics only increasing measurement points are shown and measurement points close to zero are not displayed.

The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k - which can be larger than 2 according to ASTM E898 and EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: NIST NIST-F

Weight Set No.:	182 50's & 25's	Date of Issue:	25-Jun-2019
Certificate Number:	OR-19-186-F	Calibration Due Date:	30-Jun-2021

Remarks

Equipment condition: Good

Calibration after installation

The recording of false fictitius or fradulent statements or entries on this document may be punishable as a felony under fedral Statue

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with k=2 in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use: $10.0 \cdot 10^{-6}$ / K

Temperature range on site for the evaluation of the measurement uncertainty in use: 10 K

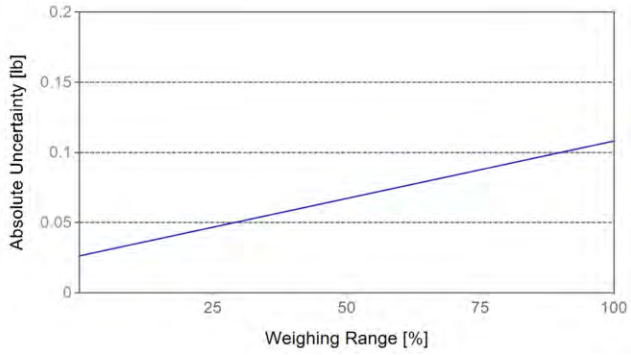
Linearization of Uncertainty Equation

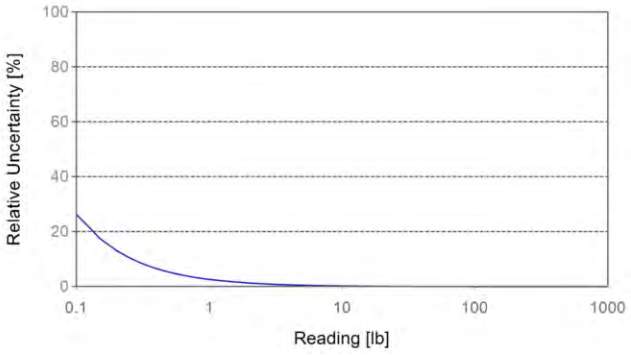
Range			As Found	As Left
	d	Max		
1	0.02 lb	1000 lb	N/A	U_1 = 0.026 lb + 0.0000818 lb/lb · R

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication	As Found		As Left	
1.00 lb	N/A	N/A	0.026 lb	2.6%
10.00 lb	N/A	N/A	0.027 lb	0.27%
100.00 lb	N/A	N/A	0.034 lb	0.034%
500.00 lb	N/A	N/A	0.067 lb	0.013%
1000.00 lb	N/A	N/A	0.11 lb	0.011%





As Found As Left

METTLER TOLEDO Service

Handbook 44 Tolerance Assessment (Acceptance)

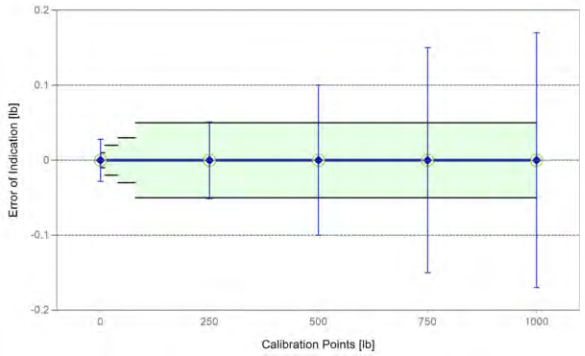
Assessment done without considering measurement uncertainty.
The measurements from the attached calibration certificate were assessed against the Tolerances defined by NIST Handbook 44.
The range of measurements for both Eccentricity and Repeatability (if performed) tests is assessed against Maintenance Tolerances.

	As Found	As Left
Overall	✓	✓

✓ = Passed
✗ = Failed

Weighing Device

Range	Max. Capacity	Readability (d)	Verification Scale Interval (e)	Class
1	1000 lb	0.02 lb	0.02 lb	III



Tolerances according to NIST Handbook 44

Test Load		Tolerance
From	To	
0.00 lb	0.00 lb	0.005 lb
0.02 lb	10.00 lb	0.01 lb
10.02 lb	40.00 lb	0.02 lb
40.02 lb	80.00 lb	0.03 lb
80.02 lb	1000.00 lb	0.05 lb

○ As Found
◆ As Left
— Tolerance

Eccentricity and Repeatability

Test	Test Load	Tolerance	As Found		As Left	
			Max. Error / Range	Result	Max. Error / Range	Result
Eccentricity (Max. Error)	325 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
Eccentricity (Range)	325 lb	0.1 lb	0.00 lb	✓	0.00 lb	✓
Repeatability (Max. Error)	500 lb	0.05 lb	N/A	N/A	0.02 lb	✓
Repeatability (Range)	500 lb	0.10 lb	N/A	N/A	0.02 lb	✓

Max. Error: Maximum of the absolute values of the individual errors.
Range: Difference between largest and smallest measurement value.

Error of Indication

	Reference Value	Tolerance	As Found		As Left	
			Error of Indication	Result	Error of Indication	Result
1	0 lb	0.01 lb	0.00 lb	✓	0.00 lb	✓
2	250 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
3	500 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
4	750 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
5	1000 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
6	750 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
7	500 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
8	250 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
9	0 lb	0.01 lb	0.00 lb	✓	0.00 lb	✓

Appendix E

United States Stove Company Quality Assurance Plan for EPA Certified Models

United States Stove Company has contracted with PFS-TECO to conduct regular (at least annual) unannounced audits of the manufacturing facility, appliance and quality assurance plan under ISO-IEC Standard 17065 to insure United States Stove Company Quality Assurance plan is implemented. PFS-TECO is authorized and required to submit the results of all audits to United States Stove Company and the EPA Administrator within 30 days of the audit. The Audit report will identify any deviations from the United States Stove Company quality assurance plan and corrective actions that need to be taken to address each identified deficiency.

United States Stove Company's EPA certified models will be evaluated to determine an inspection process that insures all units within a certified model line will be similar in all material aspects that would affect emissions. This evaluation has determined what parts, dimensions and assemblies are to be measured and documented on a completed unit and what parts are necessary to be inspected and documented before assembly of the unit.

An EPA Certified models parts determined necessary to be inspected prior to assembly may be found within the K-list document for the model line and/or the test report supplied by the accredited laboratory.

The part inspections are documented and filed with the corresponding physical unit inspection file or log. Parts purchased and manufactured by other suppliers and vendors, such as gaskets are inspected upon receipt into the factory prior to release for production of a heater.

Inspection frequency will be conducted at a rate of every 100 heaters produced.

Quality Assurance inspections of an EPA certified model will review the K-list document of the EPA certified model line. Nominal vs. actual measurements will be recorded and the results of will be maintained in a physical unit inspection file or log. The following components (when applicable) will be included in each inspection:

- **Firebox: Dimensions**
- **Air Inlet Systems: Cross sectional area of restrictive air inlets and outlets, location and method of control**
- **Baffles: Dimensions and Locations**
- **Refractory/Insulation: Dimensions, and Location**
- **Catalyst: Dimensions and Location**
- **Catalyst bypass mechanism and catalyst bypass gap tolerances (when bypass mechanism is in closed position): Dimensions, Cross-Sectional Area, and Location**
- **Flue Gas Exit: Dimensions and Location**
- **Door and Catalyst Bypass Gaskets: Material, Dimensions, and Fit**
- **Outer Thermal Shielding and Thermal Coverings: Dimensions and Location**
- **Fans: Speed and Power Rating (Performance)**

For Heaters Equipped with Fuel Feed Systems

- **Auger: Dimensions and Location**
- **Feed Motor: Speed and Power Rating (Performance)**

Inspection tolerances are -/+0.25" for any linear dimension and +/-5% for any cross sectional area relating to air induction systems and, if applicable, catalyst bypass gaps. Any measurement or dimension out of tolerance will be documented and all corrective actions taken to remedy the deficiency will be documented in the unit inspection file to be reviewed in accredited laboratory inspections.

UNITED STATES STOVE CO. EST. 1869	EPA Quality Assurance Checksheet		
	Approved By: John Voorhees	Revision: 01	Page **1** of **1**
	Initial Release Date: 01/17/2017	Revision: 11/19/2020	
Model:	5522 Series		
Inspection Date:			
Serial:		**Refer to N:\Engineering\Production Released Dwgs and Manuals for most up to date Print Revision Level*	
Inspector:			

EPA Quality Assurance Check Sheet

Inspection frequency should be conducted at a rate of every 100 heaters produced

Dimensional Checks:

All dimensions are in milimeters unless otherwise specified. Inspection tolerances are -/+6.4mm for any linear dimension and +/-5% for any cross sectional area relating to air induction systems

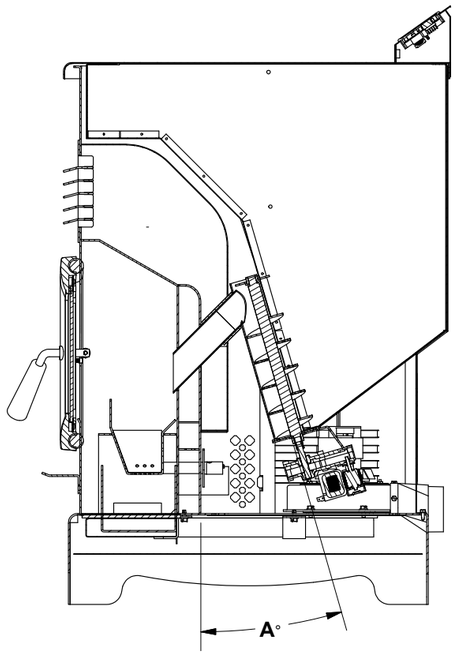
	Nominal	Actual
A	16°	
B	45.2	
C	72.6	
D	77.2	
E	145.3	
F	89.7	
G	74.2	
H	12.7	
I	4.8 (25 plcs)	
J	7.9	
K	13.0	
L	8.2	
M	9.9	
N	62.2	
O	44.5	
P	51.6	

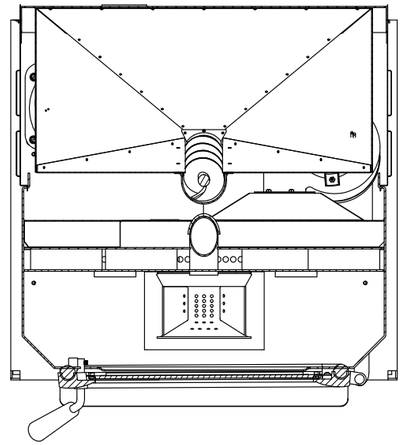
	Nominal	Actual
Q	68.3	

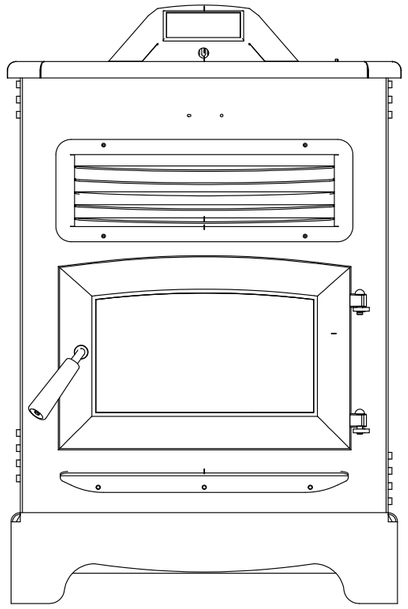
	Pass	Fail	N/A
Door Sealing:			
Does the door (s) seal properly against the firebox? (Use appropriate gauge for testing)	☐	☐	☐
Baffle:			
Is the location of the baffle correct?	☐	☐	☐
Is there any damage to the baffle?	☐	☐	☐
Fans:			
Do the fans match the specifications (speed/power/performance) on the K-list?	☐	☐	☐
Motors:			
Do the motors match the specifications (speed/power/performance) on the K-list?	☐	☐	☐

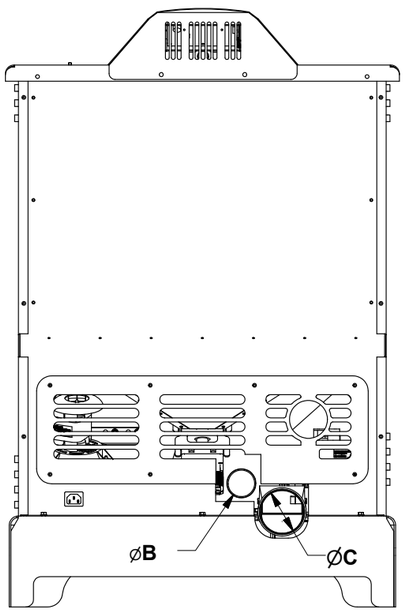
Non-Conformities for Corrective Action:

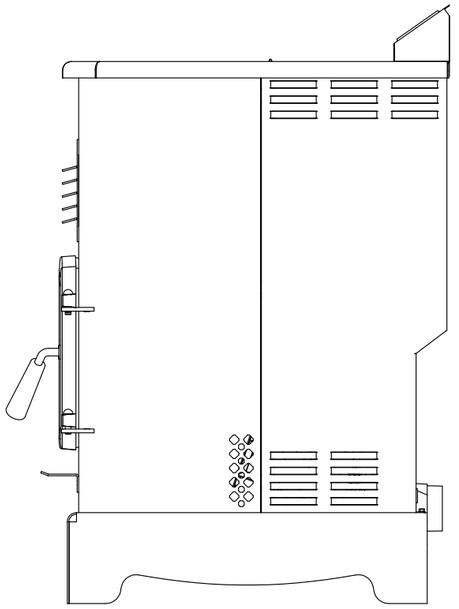
Document any non-conformities that require corrective action


A°



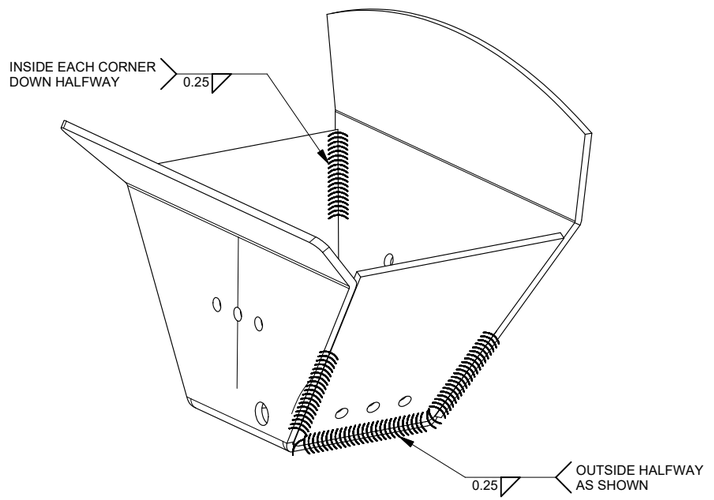



øB
øC

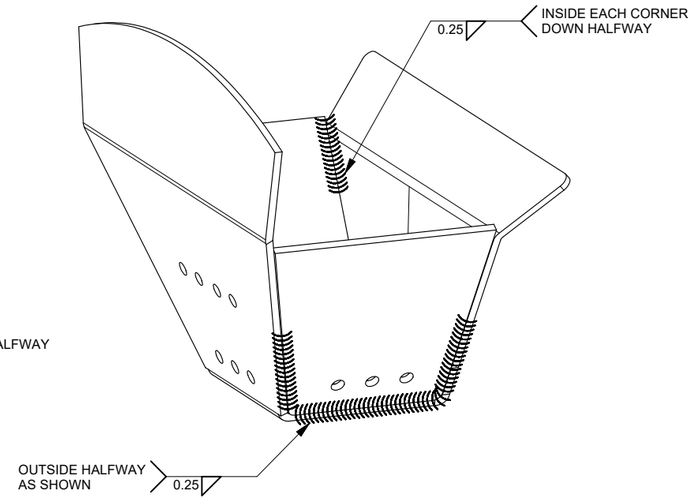


PARTS LIST			
ITEM	PART NO	TITLE	QTY
1	893628	BURNPOT	1
2	893627	BURNPOT SIDE	2

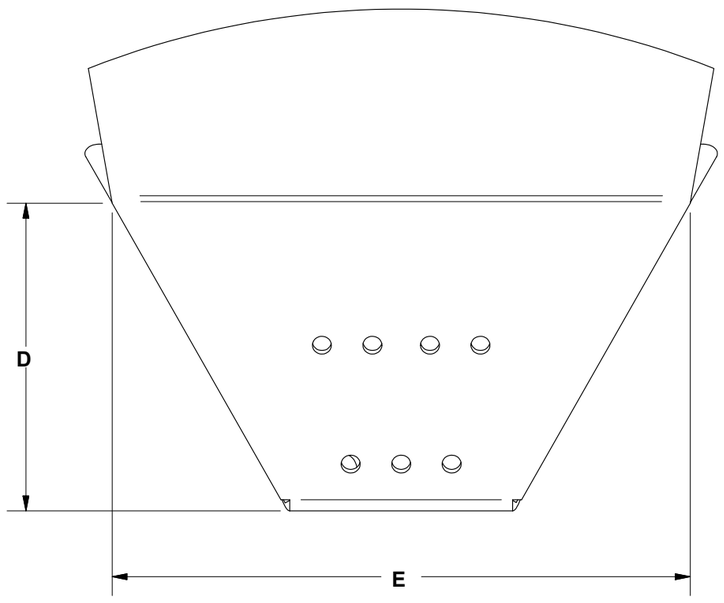
REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	12/15/21	TDA

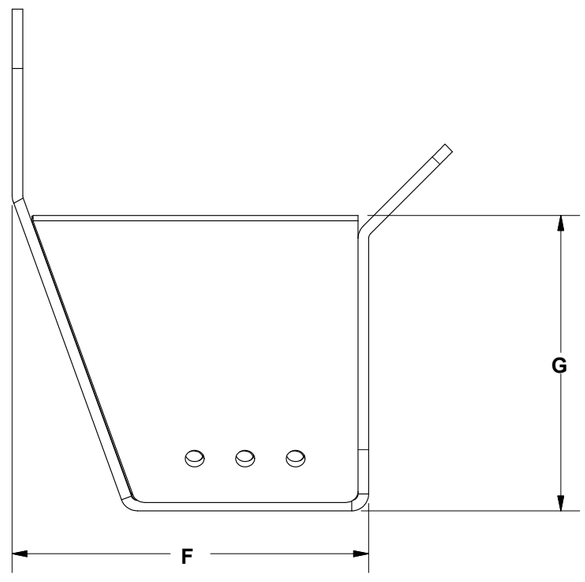


ISOMETRIC VIEW
SCALE 1 /2



ISOMETRIC VIEW
SCALE 1 / 2





GENERAL NOTES:

ALL FORMED DIMENSIONS ARE TO THE OUTSIDE OF THE PART, UNLESS SPECIFIED OTHERWISE.

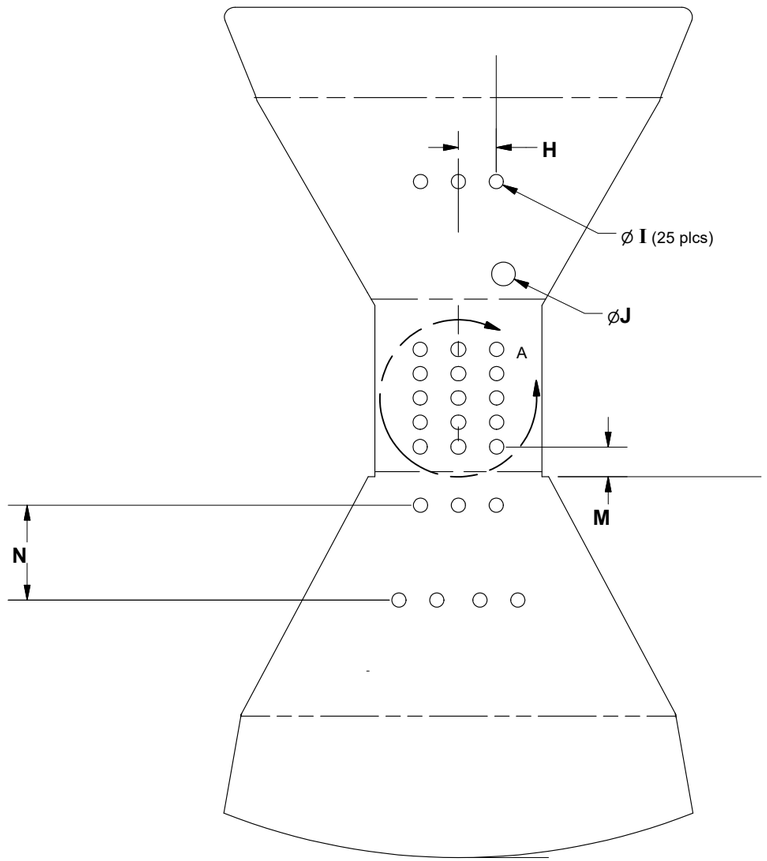
TOLERANCES
EXCEPT AS NOTED
HOLES ± .005"
DECIMAL ± .XX = 0.03 .XXX = 0.010
ANGULAR ± 2˚

DESCRIPTION: WELDMENT
FINISH:
REFERENCE: VARIOUS
SCALE: 1:2
DWN BY: TDA
DATE: 12/15/2021
SIZE: B
REV: A

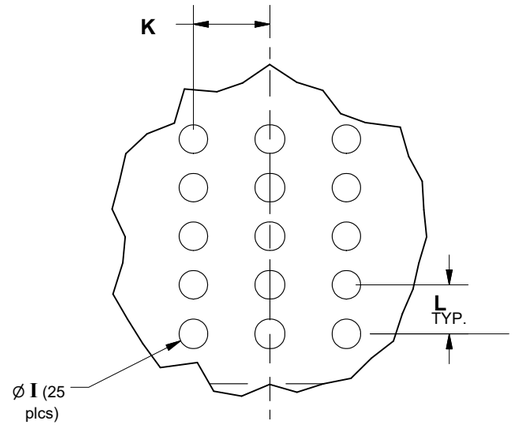
UNITED STATES STOVE COMPANY
ESTABLISHED 1869

TITLE: BURNPOT
NUMBER: 893629
SHEET: 1 OF 1

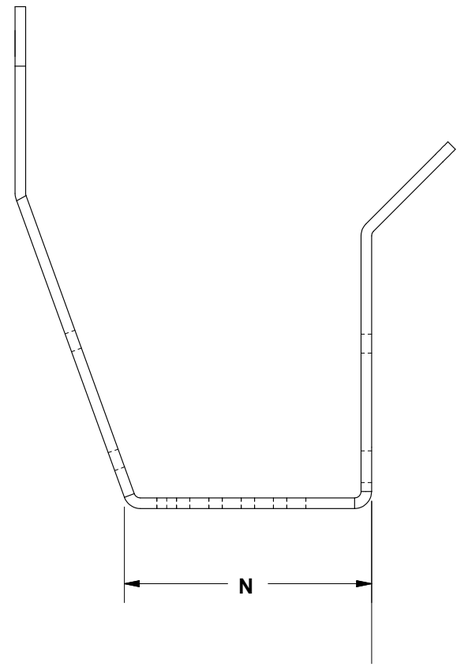
REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	12/15/21	TDA



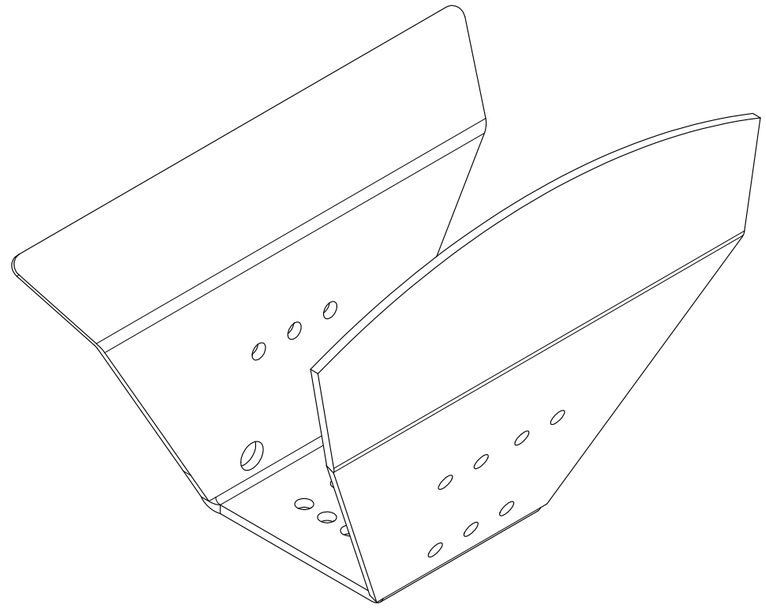
FLAT PATTERN
SCALE 1 / 2



DETAIL A
SCALE 1 : 1



FORMED VIEW
SCALE 1 / 1.5



ISOMETRIC VIEW
SCALE 1 / 1.5

GENERAL NOTES:

ALL FORMED DIMENSIONS ARE TO THE OUTSIDE OF THE PART, UNLESS SPECIFIED OTHERWISE.

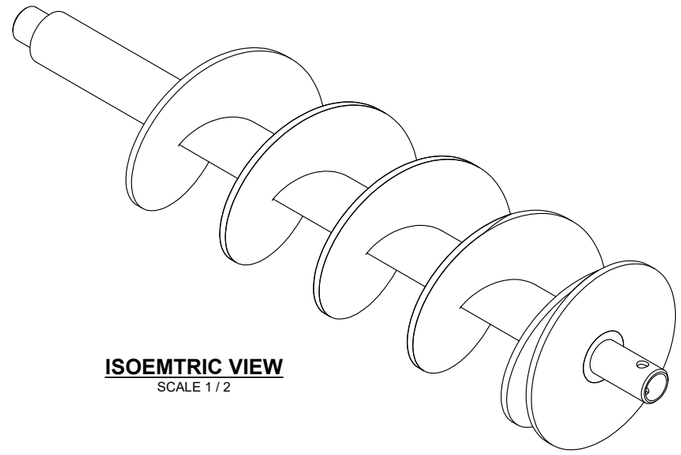
TOLERANCES EXCEPT AS NOTED
HOLES ± .005"
DECIMAL ± .XX = 0.03 XXX = 0.010
ANGULAR ± 2˚

DESCRIPTION: 12 GA. STAINLESS
FINISH:
REFERENCE:
SCALE: 1:1.5
DWN BY: TDA
DATE: 12/15/2021
SIZE: B
REV: A

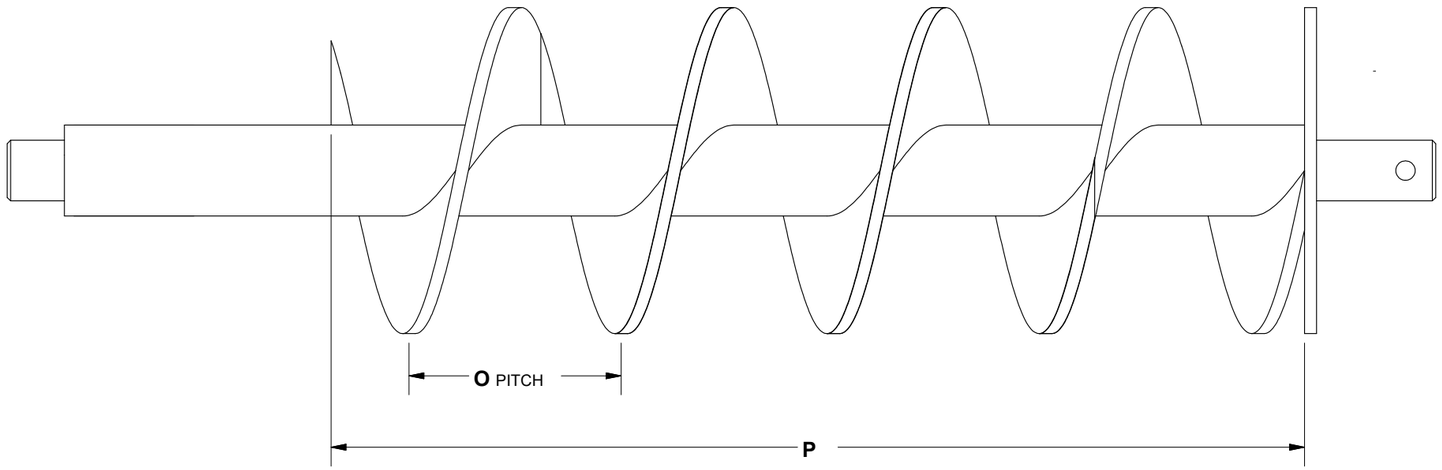
UNITED STATES STOVE COMPANY
ESTABLISHED 1869

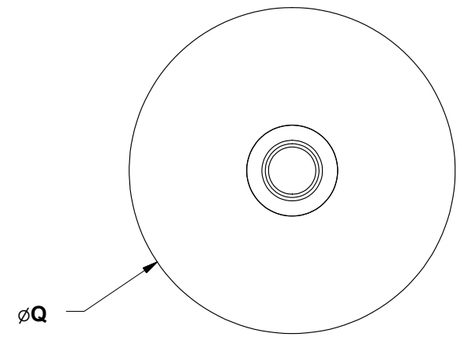
TITLE: BURNPOT
NUMBER: 893628
SHEET: 1 OF 1

REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	2/23/22	TDA



ISOEMTRIC VIEW
SCALE 1 / 2





GENERAL NOTES:

ALL FORMED DIMENSIONS ARE TO THE OUTSIDE OF THE PART, UNLESS SPECIFIED OTHERWISE.

TOLERANCES EXCEPT AS NOTED	HOLES ± .005"	DESCRIPTION PURCHASED	SCALE 1:1.25	SIZE B	REV A	*UNITED STATES STOVE COMPANY* ESTABLISHED 1869	
	DECIMAL ± .XX = 0.03 .XXX = 0.010	FINISH	DWN BY	TITLE LARGE AUGER		NUMBER 893658	SHEET 1 OF 1
	ANGULAR ± 2˙	REFERENCE 5522	DATE 2/23/2022				