EPA Certification Test Report

The following models are EPA certified under the following attached test report:	**i2450/Hi2450**
	Model #
Wood Stoves	N/A
Wood Inserts	i2450 Hi2450
Wood Fireplaces	N/A
Pellet Stoves	N/A
Pellet Inserts	N/A

Full US Environmental Protection Agency ("EPA") certification test reports have been reported to the EPA. Test reports may contain sensitive, confidential business information which has been specifically excluded and/or redacted from this publicly posted test report.

Published February 16, 2022

Fireplace Products International, Ltd.

Project # 19-469
Model: I2450M
AKA: HI2450M
Type: Wood-Fired Fireplace Insert
April 23, 2019
Revised: June 24, 2021,
February 16, 2022

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

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Revision Summary

Date: 4/23/2019 – Original Issue

Date: 6/24/2021 – The following revisions were made per a request from EPA:

-Run 2 lab sample data page in Appendix A was cleaned up to reduce confusion with some weights, no changes made to final catch numbers, see page 105 in Non-CBI report.

-The “Notes” section was edited to clarify conditions during pre-test conditioning burns, see page 5.

-The manufacturer’s test burn instructions we added to Appendix A, see page 25 in Non-CBI Report.

-The owner’s manual was edited to provide more detail on proper operation, see pages 19 and 27 of the owner’s manual for the I2450 and H2450, respectively, in Appendix B (Non-CBI report page 278 and 322, respectively).

-Cleaned up test run 3 data files in Appendix A, test run was aborted and some of the data is incomplete/non-sensical due to calculation errors from a test that did not run to completion, see pages 109-127 of Non-CBI report.

-Added Run 3 technician notes to Appendix A, notes from this aborted run were previously omitted erroneously, see page 128 of Non-CBI Report.

-Added a drawing of the Firebox to the main body of the report, see page 12.

Date: 2/16/2022 – The following revisions were made per a request from EPA:

-The “Test Run Narrative” section was edited to clarify that test run 4 was appropriate and valid, see page 9.

-The “Settings and Run Notes” section was edited to clarify that the low burn test was performed at the lowest possible air setting, see page 10.

Contents

Affidavit

PFS-TECO was contracted by Fireplace Products International Ltd. (FPI) to provide testing services for the I2450M Wood-Fired Room Heater per ASTM E3053, *Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters Using Cordwood Test Fuel*, which was approved for use under EPA ALT-125. All testing and associated procedures were conducted at PFS-TECO's Portland Laboratory beginning on 4/8/2019 and ending on 4/11/2019. PFS-TECO's Portland Laboratory is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 97015. Testing procedures followed ASTM E3053, with variances as described in EPA ALT-125. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel,* with the exception of caveats described in EPA ALT-125*.* A copy of EPA ALT-125 is included in Appendix A for reference, as required by the approval letter.

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

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

Aaron Kravitz, Testing Supervisor

Introduction

FPI-Regency Fireplaces Products of Delta, BC, contracted with PFS-TECO to perform EPA certification testing on I2450M Wood-Fired Room Heater. All testing was performed at PFS-TECO's Portland Laboratory. Testing was performed by Sebastian Button and Aaron Kravitz.

Notes

- Prior to start of testing, 50 hours of conditioning was performed by FPI lab staff as a medium burn setting using fuel with a dry moisture content of 18-28%, per ASTM E3053.
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- Front filters were changed on sample train A at one hour for all 4 test runs.
- A total of 4 test runs were attempted. One run was aborted due to a sampling proportionality violation, so it produced no results. Three complete test runs were performed in accordance with ASTM E3053. For the three test runs used in the weighted average, no anomalies occurred. See the Run Narrative section for further detail on each run.

Wood Heater Identification and Testing

- Appliance Tested: ***I2450M***
- Serial Number: ***Un-serialized Prototype – PFS Tracking Number 0022***
- Manufacturer*:* ***FPI-Regency Fireplace Products***
- Catalyst: ***No***
- Heat exchange blower: ***Integral***
- Type: ***Wood Stove***
- Style: ***Insert***
- Date Received: ***Thursday, April 04, 2019***
- Testing Period – Start: ***Monday, April 08, 2019***
  Finish: ***Thursday, April 11, 2019***
- Test Location: ***PFS-TECO Portland Laboratory***
  11785 SE HWY 212 - Suite 305, Clackamas, OR 97015
- Elevation: ***~131 Feet above sea level***
- Test Technician(s): ***Sebastian Button & Aaron Kravitz***
- Observers: ***Radu Costei of FPI.***

Test Procedures and Equipment

All Sampling and analytical procedures were performed by Sebastian Button. All procedures used are directly from ASTM E3053 and ASTM E2515. See the list below for equipment used. See Appendix C submitted with this report for calibration data.

Equipment List:

Equipment ID#	Equipment Description
041	Rice Lake 3'x3' floor scale w/digital weight indicator
050	Digiweigh DWP12i Platform Scale
053	APEX XC-60 Digital Emissions Sampling Box A
054	APEX XC-60 Digital Emissions Sampling Box B
055	APEX Ambient sampling box
057	California Analytical ZRE CO2/CO/O2 IR ANALYZER
064	Digital Barometer
109A/B	Troemner 100mg/200mg Audit Weights
107	Sartorius Analytical Balance
051	10 lb audit weight
090	Dewalt Tape Measure
092	Digital Calipers
095	Anemometer
111	Microtector
115	Delmhorst Wood Moisture Meter
CC700832	Gas Analyzer Calibration Span Gas
CC170624	Gas Analyzer Calibration Mid Gas

Results

The weighted average emissions rate for the 3 run test series was measured to be **1.38 g/hr** with a Higher Heating Value efficiency of **67.0%.** The average CO emission rate for the 3 tests was **1.43 g/min.** The FPI I2450M Wood-Fired Room Heater meets the 2020 cordwood PM emission standard of ≤ 2.5 g/hr per CFR 40 part 60, §60.532 (c).

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

Summary Table

	Low Fire Test	**Medium Fire Test**	**High Fire Test**
Date	4/9/2019	4/11/2019	4/8/2019
Run Number	2	4	1
PM Emission Rate (g/hr)	0.78	0.89	3.58
Burn Rate (kg/hr)	1.10	1.25	2.74
Heat Output (BTU/hr)	14,169	15,567	34,612
HHV Efficiency (%)	68.2	66.4	66.0
LHV Efficiency (%)	73.0	71.0	70.6
CO Emissions (g/MJ output)	5.74	4.95	2.59
CO Emissions (g/kg dry fuel)	78.24	65.66	34.16
CO Emissions (g/min)	1.43	1.35	1.58
1st Hour Emission Rate (g/hr)	3.77	3.48	5.31
Weighting Factor (%)	40	40	20
Weighted particulate emission average of 3* test runs: 1.38 grams per hour.			
Weighted average HHV efficiency of 3* test runs: 67.0%.			
Average CO emission rate for 3* test runs: 1.43 grams per minute			

**Four test runs were attempted but run number 3 (an attempted medium burn) was aborted due to proportional rate violation.*

Test Run Narrative

Run 1

Run 1 was performed on 4/8/2019 as a high fire test run per ASTM E3053. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 26 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. Total test time was 190 minutes, main test fuel load burn time was 163 min. The particulate emissions rate from kindling ignition to test completion was 3.58 g/hr. The burn rate of the test fuel load was 2.74 kg/hr. The main test load portion of the run had an overall HHV efficiency of 66.0%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 2

Run 2 was performed on 4/9/2019 as a low fire test run per ASTM E3053. The overall test duration was 525 minutes. The burn rate for the test run was 1.10 kg/hr. The particulate emissions rate for the test run was 0.78 g/hr. The run had an overall HHV efficiency of 68.2%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 3

Run 3 was performed on 4/10/2019 as a medium fire test run per ASTM E3053. A non-sampling high fire burn was conducted to prepare a coal bed. The test run continued for 87 minutes, at which point both sampling pumps developed high vacuums and could not maintain sample rates. By the time technicians could respond to the issue, the sampling proportionality could not be recovered. Therefore, the test run was aborted, and no results can be computed.

Run 4

Run 4 was performed on 4/11/2019 as a medium fire test run per ASTM E3053. The overall test duration was 471 minutes. The burn rate for the test run was 1.25 kg/hr, therefore the medium fire category requirements were met, less than the mid-point of the high and low burn rates (1.92 kg/hr). The particulate emissions rate for the test run was 0.89 g/hr. The run had an overall HHV efficiency of 66.4%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all criteria were met.

Test Conditions Summary

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

Runs	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	77	81	31.9	27.5	29.86	7.1[1]	22.6	22.4	190[2]
2	83	79	26.5	27.8	30.13	21.5	25.8	21.5	525
4	82	80	25	31.8	29.96	21.8	26.4	22.3	471

[1]This is the weight of the kindling and startup fuel

[2]Total test time was 190 min, high fire test load burn duration was 163 min.

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.

The air setting used for the low fire test was the lowest possible setting available on the appliance.

Settings & Run Notes

	Pre-Burn Air Setting	Test Run Air and Fan Settings
Run 1	N/A – Cold Start Ignition	Air control set to high fire test setting, blower off for first 20 min, then set to high.
Run 2	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to low fire test setting, blower off for first 30 min, then set to low.
Run 4	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to medium fire test setting, blower off for first 20 min, then set to low.

Appliance Description

Model(s): I2450M, HI2450M

Additional Models Discussion: In addition to the tested model, this design is offered as the HI2450M. The only difference between the two models is that the I2450M features a formed steel fireplace fascia, while the HI2450M features a decorative cast iron fascia. Both models use an identical design in all aspects that may affect emissions or air control and are presumed to have the same emissions performance as the test specimen provided for certification.

Appliance Type: Wood-Fired Fireplace Insert

Firebox Volume: 2.24 ft^3

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

Baffles: A pair of mating 9.438" x 15.0" x 1.00" vermiculite panels mate together to form a baffle which rests on top of the secondary air tubes.

Refractory Insulation: The firebox is lined with 1" thick firebrick.

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

Catalytic Combustor: N/A

Fan: The I2450M is equipped from the factory with a convection fan that attached to the front of the appliance beneath the loading door.

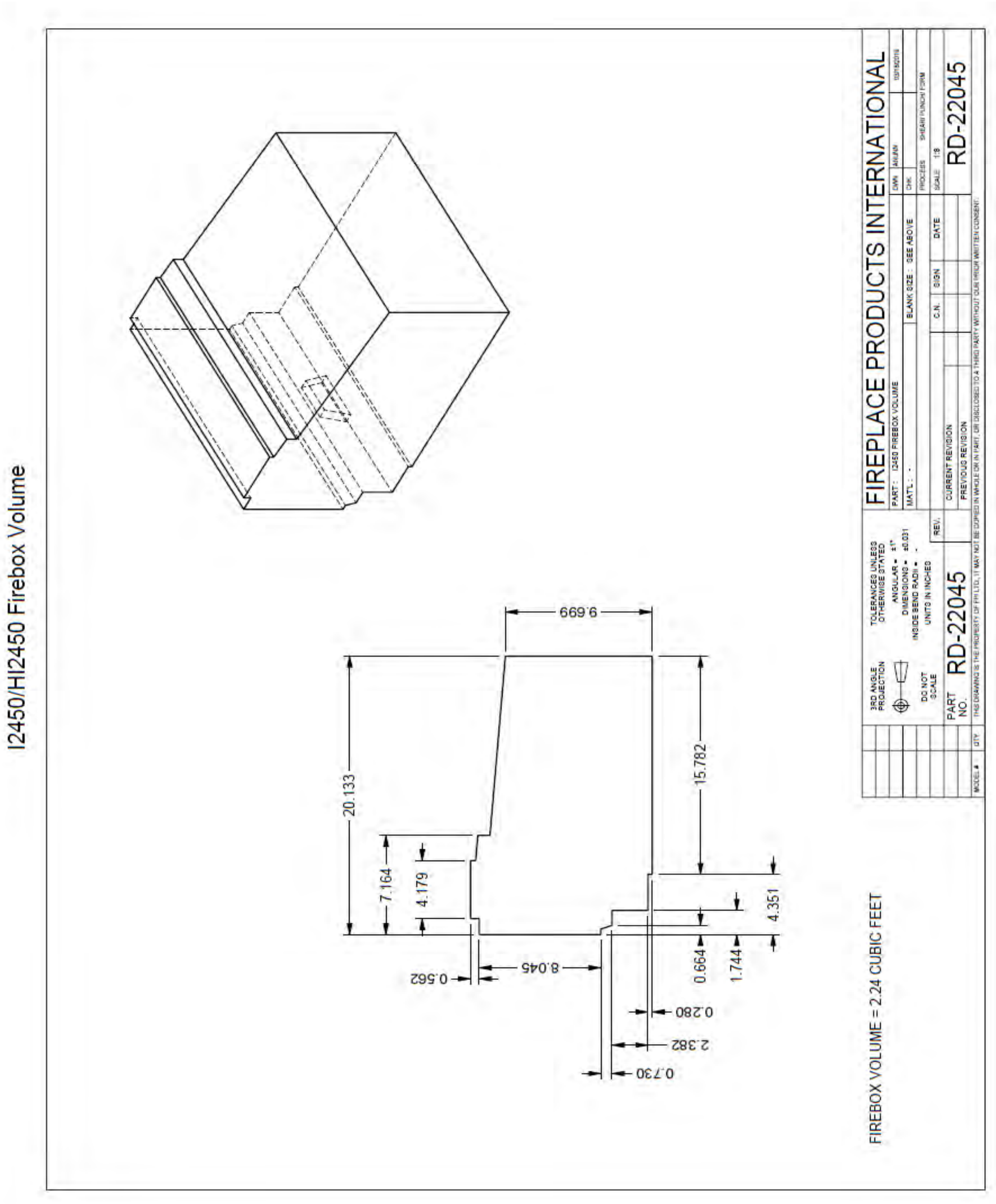
Appliance Dimensions

I2450M Unit Dimensions

Height	Width	Depth	Firebox Volume	Weight
22"	35"	28"	2.24 ft^3	330 lbs

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

Firebox Volume



Appliance Front

Appliance Left

Appliance Right

Appliance Rear

Test Fuel Properties

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

Typical Kindling Load

Typical Startup Load

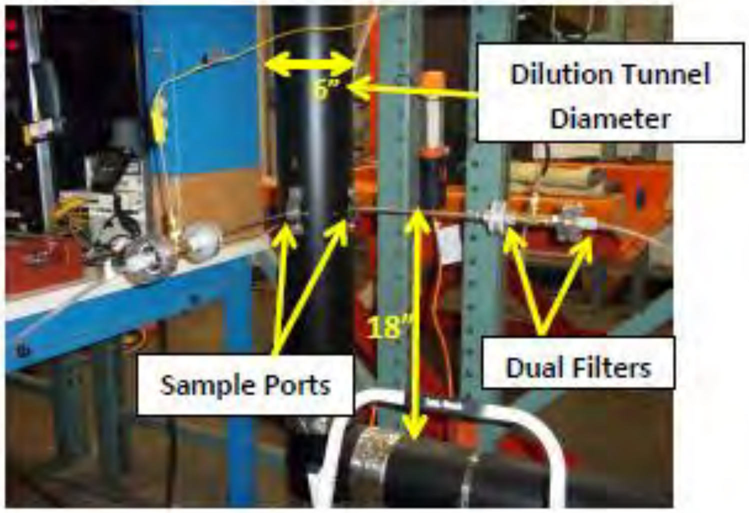
Typical High Fire Load

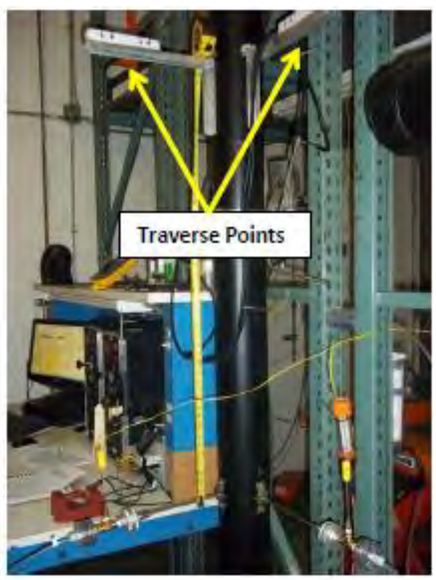
Typical Low Fire Load

Sampling Locations and Descriptions

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

Sample Points





Sampling Methods

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

Analytical Methods Description

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

Calibration, Quality Control and Assurances

Calibration procedures and results were conducted per EPA Method 28R, ASTM E2515-11 and ASTM E3053. Test method quality control procedures (leak checks, volume meter checks, stratification checks, proportionality results) followed the procedures outlined.

Appliance Sealing and Storage

Upon completion of testing, the appliance was secured with metal strapping and the seal below was applied, the appliance was then returned to the manufacturer's location at: 6988 Venture St, Delta, BC V4G 1H4, Canada, for archival.

Sealing Label

ATTENTION:

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

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

REPORT #______________________ DATE SEALED____________________

MANUFACTURER________________ MODEL #_________________________

Sealed Unit

List of Appendices

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

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

Appendix B – Labels and Manuals

Appendix C –Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

Conditioning Data

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Date(s):	3/20/19 - 4/1/2019	Technician:	SJB

Elapsed Time (hrs)	Scale Reading (lbs)	Weight Change (lbs)	Flue (°F)	Ambient (°F)	Catalyst Exit (°F)
		Average:	**324.8**	**69.5**	**N/A**
0	26.0	-	432	65	N/A
1	15.2	-10.8	475	67	N/A
2	7.0	-8.2	405	68	N/A
3	4.1	-2.9	291	67	N/A
4	3.1	-1.0	237	65	N/A
5	2.1	-1.0	223	65	N/A
6	1.3	-0.8	213	63	N/A
7	0.5	-0.8	202	63	N/A
8	26.0	25.5	435	66	N/A
9	16.7	-9.3	412	65	N/A
10	9.6	-7.1	400	68	N/A
11	5.1	-4.5	335	68	N/A
12	3.7	-1.4	246	67	N/A
13	2.7	-1.0	230	66	N/A
14	1.7	-1.0	228	65	N/A
15	0.9	-0.8	211	64	N/A
16	0.2	-0.7	195	64	N/A
17	26.5	26.3	420	72	N/A
18	14.8	-11.7	574	72	N/A
19	6.2	-8.6	433	73	N/A
20	3.8	-2.4	318	72	N/A
21	2.4	-1.4	280	70	N/A
22	1.2	-1.2	264	70	N/A
23	0.3	-0.9	238	71	N/A
24	25.7	25.4	475	67	N/A
25	12.2	-13.5	559	68	N/A
26	5.0	-7.2	407	69	N/A
27	3.4	-1.6	278	68	N/A
28	2.3	-1.1	252	67	N/A
29	1.4	-0.9	230	67	N/A
30	0.6	-0.8	214	67	N/A
31	26.8	26.2	432	73	N/A
32	15.6	-11.2	521	75	N/A
33	7.9	-7.7	448	76	N/A
34	4.8	-3.1	316	75	N/A
35	3.2	-1.6	284	73	N/A
36	2.1	-1.1	262	73	N/A
37	1.1	-1.0	245	72	N/A
38	0.2	-0.9	232	71	N/A
39	26.2	26.0	396	74	N/A
40	16.0	-10.2	430	74	N/A
41	9.3	-6.7	383	74	N/A
42	6.4	-2.9	265	73	N/A
43	4.6	-1.8	240	73	N/A
44	3.6	-1.0	227	72	N/A
45	2.7	-0.9	225	72	N/A
46	1.8	-0.9	217	71	N/A
47	1.0	-0.8	209	70	N/A
48	0.3	-0.7	198	69	N/A
49	26.2	25.9	439	72	N/A
50	15.7	-10.5	486	72	N/A

Signature/Date: 4/4/19

WOOD HEATER TESTING SUMMARY

SECTION 1 – Model Identification	
Model Name(s)/Number(s)	I2450, HI2450
Manufacturer	FPI - Regency Fireplaces Products
Address 1	6988 Venture St.
Address 2	Delta, BC V4G 1H4
Appliance Category(s) (Free-standing, Insert, etc.)	Fireplace Insert
Usable Firebox Volume - ft^3	2.24
Catalytic/Non-Cat	Non-Cat
Convection Air Fan (No, Standard, Optional)	Optional
SECTION 1B – Laboratory Information	
Testing Laboratory	PFS-TECO
Address 1	11785 SE Hwy 212 Ste 305
Address 2	Clackamas, OR 97015
ISO/Accreditation Info	ISO 17025
Dates Tested	4/8/2019 - 4/11/2019
Test Methods/Standards	ASTM E3053 (ALT-125), ASTM E2515
Dilution Tunnel Inside Diameter - in.	6.00
Fliter Diameter - mm	47
Filter Material	Pall Type TX40

SECTION 2 – Test Conditions Summary

Model Name(s)/Number(s)	I2450, HI2450			
Usable Firebox Volume - ft^3	2.24			
Convection Air Fan (No, Standard, Optional)	Optional			
Test Run #	2	4	1	
Date Tested	4/9/2019	4/11/2019	4/8/2019	
Test Run Category (L, M, H)	L	M	H	
Average Barometric Pressure - in Hg	30.13	29.96	29.86	
Max. Observed Ambient Temp - °F	83	85	83	
Min. Observed Ambient Temp - °F	78	79	77	
Max. Observed Filter Temp - °F	88	89	89	
Test Run Air Settings				
Primary (measured up from minimum)	Minimum	0.5"	Maximum	
Secondary (measured up from minimum)	Fixed	Fixed	Fixed	
Convection Air Fan Setting	Low	Low	High	
Test Fuel Load				
Cordwood Fuel Species	Maple	Maple	Maple	
Specific Gravity (from Table 1)	0.6	0.6	0.6	
Higher Heating Value - Btu/lb (from Annex A1)	8587	8587	8587	
Nom. Test Fuel Load Piece Length - in.	17	17	17	
Number of Test Fuel Pieces	5	5	5	
Test Fuel Weight				
Kindling - As Fired lb	na	na	3.06	
Kindling Wt. - As % of Test Fuel Load	na	na	13.6%	
Kindling Moisture - % DB	na	na	10%	
Kindling - kg DB	na	na	1.26	
SU Fuel - As Fired lb	na	na	4%	
SU Fuel Wt. - As % of Test Fuel Load	na	na	0.2%	
SU Fuel Moisture - % DB	na	na	20%	
SU Fuel - kg DB	na	na	0.02	
Test Fuel Load - As Fired lb	25.81	26.36	22.58	
Ave. Test Fuel Load MC % DB	21.5%	22.3%	22.4%	
Test Fuel Load - kg DB	9.64	9.80	8.37	
Test Fuel Loading Density - lb/ft^3	11.52	11.77	10.08	
Residual SU Fuel Wt. - As Fired lb	na	na	2%	
Residual SU Fuel Wt. - As % of Test Fuel Load	na	na	0.1%	
Test Run Duration - minutes	525	471	190	
Test Run Duration - h	8.75	7.85	3.17	
Run Duration of High Fire Load Only - minutes	na	na	163	
Run Duration of High Fire Load Only - h	na	na	2.72	
Test Fuel Load Wt. at End of Test - As Fired lb	0	0	2	
Total Total Fuel Burned - kg DB	9.64	9.80	8.73	
% Test Fuel Load Wt. at End of Test	0.0%	0.0%	8.9%	

SECTION 3 – Test Run Results Summary

Model Name(s)/Number(s)	I2450, HI2450			
Usable Firebox Volume - ft^3	2.24			
Convection Air Fan (No, Standard, Optional)	Optional			
Test Run #	2	4	1	
Date Tested	4/9/19	4/11/19	4/8/19	
Test Run Category	L	M	H	
Burn Rate - kg/h DB	1.10	1.25	2.74	
Burn Rate - As % of Low to High Midpoint	na	63%	na	
Burn Duration - h	8.75	7.85	3.17	
Heat Output - Btu/h	14,169	15,567	34,612	
Average Dilution Tunnel Flow Rate - dscfm	185.90	180.10	180.20	
Average Sample Flow Rates - dscfm				
Train 1	0.152	0.151	0.151	
Train 2	0.149	0.149	0.148	
Total PM Emissions - g				
Train 1	7.22	7.46	11.78	
Train 2	6.44	6.48	10.87	
Average	6.830	6.970	11.325	
PM Emission Train Precision - %	5.7%	7.0%	4.0%	
PM Emission Train Precision - g/kg	0.08	0.10	0.10	
PM Emission Rate - g/h	0.78	0.89	3.58	
Total CO Emissions - g	751	638	257	
CO Emissions Rate - g/h	86	81	81	
Overall Efficiency - CSA B415.1-10				
% HHV Basis	68.2	66.4	66.0	
% LHV Basis	73.0	71.0	70.6	

SECTION 4 - Weighted Average Summary

Model Name(s)/Number(s)	I2450, HI2450		
Usable Firebox Volume - ft_3	2.24		
Convection Air Fan (No, Standard, Optional)	Optional		
Average for Each Test Run Category	L	M	H
Burn Rate - kg/h DB	1.10	1.25	2.74
PM Emission Rate - g/h	0.78	0.89	3.58
CO Emissions Rate - g/h	85.8	81.3	81.2
Overall Efficiency - CSA B415.1-10			
% HHV Basis	68.2	66.4	66.0
% LHV Basis	73.0	71.0	70.6
Heat Output - Btu/h	14200	15600	34600
Category Weighting	40%	40%	20%

ASTM E 3053 Weighted Averages			
PM Emission Rate - g/h	1.38		
CO Emissions Rate - g/h	83.1		
Overall Efficiency - CSA B415.1-10			
% HHV Basis	67.0		
% LHV Basis	71.7		
Heat Output Range - Btu/h	14200	to	34600

Emission testing instructions I2450

Volume: 2.24 cu.ft.

Low and Medium

High before Low and Medium – no sampling. Air set to High Setting

Fan on high at 20 min after loading main fuel load

Kindling – 3.0lb

Startup fuel – 4.0lb

Procedure

Start with a couple pieces of crumbled paper in between and 1.7 lbs kindling. Adjust the door opening for less smoke and establish a good fire. Keep the door open in that position for 2 – 3 min.

At ~0.8lb load the remainder of the kindling fuel and 1.5lbs of start-up fuel close door soon after loading.

At ~1b load remaining SU fuel and close the door right away after loading.

At low end of coal bed range load the high load. Close the door right away.

At 20 min turn on the fan on high.

Around 6 lbs adjust the load. Lift the unburned pieces out from the coals and bring unburned pieces to center front to ensure full charcoalization.

Around 4.5 lbs, when everything is burned, and almost no flames left rake the coals, zero the scale and follow the standard loading procedure.

Low and Medium test load

Load heavier logs to the sides.

Keep the door open a couple seconds so there is a strong fire going.

Air adjustment

Medium

At 8 min, close air ~halfway, at 11 min set the air to medium air setting.

Fan on low at 30 min

Low

At 13-14 min set to Low setting.

Fan on low at 30 min.

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 1 Data Summary

Client: FPI
Model: I2450
Job #: 19-469
Tracking #: 0025
Test Date: 4/8/2019

	4/19/2019
Techician Signature	Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	1	Technician:	ADK/SJB
		Date:	4/8/2019

Burn Rate (kg/hr):	**2.74**

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	22.014	28.746	28.203	8.920
Average Gas Velocity in Dilution Tunnel (ft/sec)				17.66
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)				10813.7
Average Gas Meter Temperature (°F)	81.2	89.3	99.6	86.5
Total Sample Volume (dscf)	21.405	27.830	26.690	8.678
Average Tunnel Temperature (°F)				135.6
Total Time of Test (min)				190
Total Particulate Catch (mg)	0.1	9.7	8.6	4.3
Particulate Concentration, dry-standard (g/dscf)	0.0000047	0.0003485	0.0003222	0.0004955
Total PM Emissions (g)	0.16	11.78	10.87	5.31
Particulate Emission Rate (g/hr)	0.05	3.72	3.43	5.31
Emissions Factor (g/kg)	-	1.28	1.18	-
Difference from Average Total Particulate Emissions (g)	-	0.45	0.45	-
Difference from Average Emissions Factor (g/kg)	-	0.05	0.05	-

Final Average Results	
Total Particulate Emissions (g)	11.32
Particulate Emission Rate (g/hr)	3.58
Emissions Factor (g/kg)	1.23
HHV Efficiency (%)	66.0%
LHV Efficiency (%)	70.6%
CO Emissions (g/min)	1.58

Quality Checks	**Requirement**	**Observed**	**Result**
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 84 / Max: 89	OK
Face Velocity	< 30 ft/min	8.5	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min: 77 / Max: 84	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	CHECK 10 MIN. INTERVAL PRO-RATES

B415.1 Efficiency Results

Manufacturer:	FPI
Model:	I2450
Date:	04/08/19
Run:	1
Control #:	19-469
Test Duration:	163
Output Category:	High

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	66.0%	70.6%
Combustion Efficiency	98.0%	98.0%
Heat Transfer Efficiency	67.4%	72.1%

Output Rate (kJ/h)	36,487	34,612	**(Btu/h)**
Burn Rate (kg/h)	2.77	6.10	**(lb/h)**
Input (kJ/h)	55,274	52,433	**(Btu/h)**

Test Load Weight (dry kg)	7.52	16.58	**dry lb**
MC wet (%)	18.32		
MC dry (%)	22.43		
Particulate (g)	11.32		
CO (g)	257		
Test Duration (h)	2.72		

Emissions	Particulate	CO
g/MJ Output	0.11	2.59
g/kg Dry Fuel	1.51	34.16
g/h	4.17	94.60
g/min	0.07	1.58
lb/MM Btu Output	0.27	6.03

Air/Fuel Ratio (A/F)	16.13

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

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #	0025
Run #:	1	Technician:	ADK/SJB
		Date:	4/8/2019

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.24		
Target Load Weight (lbs):	22.40		
Total Load Weight Range (lbs):	21.30	to	23.50
Core Load Weight Range (lbs):	10.10	to	14.60
Remainder Load Weight Range (lbs):	7.80	to	12.30
Core Load Piece Range (lbs):	3.40	to	5.60
Remainder Load Piece Range (lbs):	2.20	to	12.30
Max Allowable Kindling Weight (lbs):	4.52		
Max Allowable Start-up Fuel Weight (lbs):	6.77		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	3.40	In Range	22.6	18.2	23.6	21.5	In Range	2.80	1.27
2	17.00	3.64	In Range	21.6	21.0	19.3	20.6	In Range	3.02	1.37
3	17.00	3.57	In Range	24.7	18.4	24.2	22.4	In Range	2.92	1.32
Core Load Wt. (lbs)		10.61	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	7.98	In Range	25.2	22.4	24.7	24.1	In Range	6.43	2.92
2	17.00	3.99	In Range	22.9	22.9	19.1	21.6	In Range	3.28	1.49
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		11.97	In Range							

Total Load Weight (lbs):	22.58	In Range	
Core Load % of Total Weight:	47%	In Range	45-65%
Remainder % of Total Weight:	53%	In Range	35-55%
Total Load % of Target Weight:	101%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	10.1		
Total Load Average Moisture Conent (%DB):	22.4	In Range	19-25%
Total Load Average Moisture Conent (%WB):	18.3		
Total Test Load Weight (dry basis):	18.44 lbs	8.37 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
3.06	In Range	10	10	10	10.0	In Range	2.78	1.26

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.03	In Range	21.3	19.7	18.5	19.8	In Range	3.36	1.53

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.3	to	4.5	
Actual Residual Start-up Fuel Weight (lb):		2.3		In Range

TEST END POINT

High Fire Test Run End Point Range:	2.0	to	2.5	lb
Actual Fuel Load Ending Weight (lb):		2.0		In Range

Total Weight All Fuel Added:	29.67 lbs, wet basis	Total Weight All Fuel Burned (dry basis):	20.25 lbs
	24.59 lbs, dry basis		9.18 kg
	11.15 kg, dry basis		

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	1	Technician:	ADK/SJB
Test Start Time:		Date:	4/8/2019
Test Type:	High Fire		

Recording Interval (min):	1	
Total Sampling Time (min):	190	
High Fire Test Load Time (min):	27	
Meter Box γ Factor:	1.004	(A)
Meter Box γ Factor:	1.000	(B)
Meter Box γ Factor:	0.999	(Ambient)
Induced Draft Check (in. H_2O):	0	
Smoke Capture Check (%):	100%	
Date Flue Pipe Last Cleaned:	4/5/2019	

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.86	29.86	29.86
Relative Humidity (%)	31.9	27.5	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		22.014	ft^3

Sample Train Post-Test Leak Checks

(A)	0.002	cfm @	-13	in. Hg
(B)	0.000	cfm @	-11	in. Hg
(Ambient)	0.000	cfm @		in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.054	85
2	0.066	85
3	0.074	85
4	0.060	85
5	0.060	85
6	0.068	85
7	0.062	85
8	0.062	85
Center	0.070	85

Static Pressure: -0.240 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	17.04	ft/sec
V_{scent}:	17.84	ft/sec
F_p:	0.955	[ratio]
Initial Tunnel Flow:	189.0	scf/min

TEST FUEL PROPERTIES

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

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

WOODSTOVE PREBURN DATA

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	1	Technician:	ADK/SJB
		Date:	4/8/2019

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

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.002		0.078	0.02	83	-0.11		1.7		85	81	84	77
1	0.108	0.106	0.068	2.34	83	0	68	1.6	-0.1	90	155	84	77
2	0.255	0.147	0.069	2.31	83	-2.74	97	1.3	-0.3	117	425	84	77
3	0.406	0.151	0.068	2.26	83	0	100	1.0	-0.3	115	430	84	77
4	0.551	0.145	0.071	2.25	83	0	94	0.9	-0.1	112	407	84	77
5	0.701	0.150	0.069	2.25	83	-0.61	98	0.7	-0.2	111	398	84	77
6	0.846	0.145	0.068	2.23	83	-1.71	95	0.7	0	109	370	85	77
7	0.997	0.151	0.065	2.24	83	-0.61	103	3.1	2.4	131	424	85	77
8	1.143	0.146	0.068	2.27	83	0	99	2.8	-0.3	143	484	85	78
9	1.295	0.152	0.070	2.28	83	-2.69	100	2.7	-0.1	125	425	86	77
10	1.441	0.146	0.067	2.27	83	-0.1	98	2.5	-0.2	122	449	86	78
11	1.592	0.151	0.071	2.27	83	-2.62	98	2.2	-0.3	124	469	86	78
12	1.737	0.145	0.069	2.25	83	-0.56	96	2.1	-0.1	124	482	86	78
13	1.888	0.151	0.064	2.24	83	-0.37	104	2.0	-0.1	126	498	86	78
14	2.033	0.145	0.067	2.23	84	-0.01	97	1.8	-0.2	126	491	86	78
15	2.184	0.151	0.071	2.25	84	-0.07	98	1.7	-0.1	126	491	86	78
16	2.330	0.146	0.070	2.26	84	-0.5	96	1.5	-0.2	126	491	86	78
17	2.479	0.149	0.072	2.25	83	-0.05	97	1.4	-0.1	126	490	86	78
18	2.626	0.147	0.068	2.24	84	-2.74	98	1.3	-0.1	126	485	86	78
19	2.775	0.149	0.071	2.24	84	-0.48	97	1.2	-0.1	126	484	86	78
20	2.923	0.148	0.071	2.22	84	-2.72	96	1.0	-0.2	126	471	85	78
21	3.071	0.148	0.068	2.22	84	-2.82	98	1.0	0	125	459	85	78
22	3.219	0.148	0.066	2.21	83	-0.22	102	3.6	2.6	150	493	85	78
23	3.366	0.147	0.069	2.19	84	-0.13	100	3.2	-0.4	166	633	85	78
24	3.513	0.147	0.070	2.16	84	-2.72	98	2.9	-0.3	150	601	86	78
25	3.660	0.147	0.064	2.15	84	-0.59	103	2.6	-0.3	150	622	85	79
26	3.809	0.149	0.073	2.22	84	-0.45	98	2.3	-0.3	152	640	86	79
27	3.954	0.145	0.065	2.12	88	-0.72	103	22.3	20	193	672	86	79
28	4.103	0.149	0.069	2.20	89	-0.74	100	22.1	-0.2	158	581	85	79
29	4.250	0.147	0.069	2.20	89	-1.83	98	21.9	-0.2	152	581	85	79
30	4.398	0.148	0.071	2.19	89	-3.3	98	21.7	-0.2	153	608	85	79
31	4.547	0.149	0.072	2.30	90	-1.6	98	21.4	-0.3	154	620	85	79
32	4.700	0.153	0.070	2.32	90	-0.88	102	21.2	-0.2	154	631	85	79

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.848	0.148	0.067	2.31	90	-1.42	101	20.9	-0.3	155	631	85	79
34	5.001	0.153	0.071	2.29	91	-1.06	101	20.7	-0.2	156	652	85	79
35	5.148	0.147	0.068	2.28	91	-0.69	99	20.4	-0.3	158	646	85	79
36	5.303	0.155	0.073	2.30	91	-3.37	101	20.2	-0.2	159	652	85	79
37	5.450	0.147	0.067	2.29	92	-0.74	100	19.9	-0.3	160	655	85	80
38	5.604	0.154	0.071	2.30	92	-3.35	102	19.7	-0.2	159	659	85	80
39	5.752	0.148	0.067	2.30	92	-1.42	101	19.4	-0.3	161	668	85	80
40	5.904	0.152	0.062	2.29	93	-0.69	107	19.1	-0.3	162	667	85	79
41	6.053	0.149	0.065	2.28	93	-0.67	103	19.0	-0.1	162	671	85	80
42	6.205	0.152	0.070	2.28	93	-0.74	101	18.5	-0.5	162	683	85	80
43	6.357	0.152	0.069	2.28	93	-2.31	102	18.4	-0.1	164	676	85	80
44	6.506	0.149	0.069	2.29	94	-2.08	100	18.1	-0.3	163	677	85	80
45	6.658	0.152	0.063	2.30	86	-3.21	108	17.9	-0.2	164	678	86	80
46	6.807	0.149	0.064	2.27	86	-2.83	105	17.6	-0.3	164	688	86	81
47	6.960	0.153	0.068	2.27	87	-0.82	105	17.4	-0.2	164	675	86	80
48	7.109	0.149	0.069	2.27	86	-0.82	101	17.1	-0.3	164	670	86	81
49	7.262	0.153	0.075	2.27	87	-0.9	99	16.9	-0.2	163	668	86	81
50	7.411	0.149	0.070	2.28	86	-0.97	100	16.6	-0.3	161	665	86	81
51	7.563	0.152	0.075	2.27	86	-1.09	99	16.4	-0.2	161	665	86	81
52	7.713	0.150	0.064	2.26	87	-3.4	105	16.0	-0.4	161	667	86	81
53	7.864	0.151	0.070	2.27	87	-3.46	101	15.9	-0.1	161	661	86	82
54	8.016	0.152	0.068	2.26	87	-0.84	104	15.7	-0.2	161	655	86	81
55	8.166	0.150	0.070	2.27	87	-0.82	101	15.4	-0.3	161	656	86	81
56	8.319	0.153	0.071	2.28	87	-1.59	102	15.2	-0.2	161	658	86	81
57	8.466	0.147	0.068	2.25	87	-2.13	100	15.0	-0.2	161	661	86	81
58	8.620	0.154	0.067	2.26	87	-2.09	106	14.7	-0.3	161	660	86	82
59	8.768	0.148	0.071	2.26	87	-2.91	99	14.5	-0.2	161	660	86	82
60	8.922	0.154	0.070	2.27	87	-3.39	103	14.1	-0.4	161	655	86	82
61	9.076	0.154	0.070	2.36	88	0	103	14.0	-0.1	160	654	85	82
62	9.230	0.154	0.069	2.36	88	-0.46	104	13.8	-0.2	161	653	86	82
63	9.383	0.153	0.068	2.30	88	-0.84	104	13.5	-0.3	161	657	87	82
64	9.534	0.151	0.066	2.29	88	-2.61	104	13.3	-0.2	162	654	87	81
65	9.688	0.154	0.070	2.28	88	0	103	13.1	-0.2	161	651	87	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.837	0.149	0.064	2.27	88	-0.14	104	12.7	-0.4	161	652	87	82
67	9.990	0.153	0.065	2.24	88	-2.05	106	12.6	-0.1	160	653	87	82
68	10.139	0.149	0.064	2.25	88	-0.77	104	12.4	-0.2	160	651	87	82
69	10.292	0.153	0.071	2.25	88	-0.1	102	12.0	-0.4	160	649	88	82
70	10.441	0.149	0.072	2.25	88	-0.48	98	11.9	-0.1	160	647	88	82
71	10.593	0.152	0.069	2.27	88	-0.06	102	11.7	-0.2	159	640	88	82
72	10.742	0.149	0.068	2.27	88	-1.68	101	11.5	-0.2	158	635	87	82
73	10.893	0.151	0.072	2.23	88	-2.7	100	11.2	-0.3	157	624	88	82
74	11.044	0.151	0.073	2.22	89	-1.47	99	11.1	-0.1	156	626	88	82
75	11.194	0.150	0.066	2.23	88	-1.76	103	10.9	-0.2	156	623	88	82
76	11.346	0.152	0.066	2.21	89	-0.25	104	10.7	-0.2	156	628	88	82
77	11.494	0.148	0.067	2.25	89	-0.61	101	10.5	-0.2	157	631	88	82
78	11.646	0.152	0.075	2.20	89	-0.96	98	10.3	-0.2	156	626	87	82
79	11.793	0.147	0.070	2.22	89	-2.69	98	10.0	-0.3	156	622	88	82
80	11.946	0.153	0.071	2.21	89	-2.82	101	9.9	-0.1	154	614	88	82
81	12.098	0.152	0.062	2.32	89	-0.53	107	9.8	-0.1	154	610	88	82
82	12.254	0.156	0.067	2.33	89	-0.45	106	9.6	-0.2	153	602	88	82
83	12.406	0.152	0.064	2.34	89	-2.47	106	9.4	-0.2	151	597	88	82
84	12.560	0.154	0.072	2.28	89	-0.15	101	9.2	-0.2	150	595	88	82
85	12.713	0.153	0.068	2.29	89	-0.24	103	9.1	-0.1	149	590	88	82
86	12.864	0.151	0.073	2.28	89	-2.63	98	9.0	-0.1	149	584	88	82
87	13.017	0.153	0.073	2.25	89	-0.21	99	8.8	-0.2	148	579	88	83
88	13.165	0.148	0.071	2.27	89	-2.57	97	8.7	-0.1	148	571	88	82
89	13.321	0.156	0.068	2.27	89	-2.82	105	8.6	-0.1	146	566	88	83
90	13.471	0.150	0.067	2.27	90	-2.81	101	8.4	-0.2	146	563	88	82
91	13.625	0.154	0.066	2.27	90	-0.79	105	8.3	-0.1	146	561	87	82
92	13.775	0.150	0.070	2.25	90	-2.82	99	8.2	-0.1	145	559	87	82
93	13.928	0.153	0.067	2.27	90	-1.83	103	8.1	-0.1	144	557	88	82
94	14.081	0.153	0.064	2.27	90	-2.79	105	7.9	-0.2	144	558	87	82
95	14.232	0.151	0.070	2.26	90	-0.17	99	7.8	-0.1	143	552	87	82
96	14.385	0.153	0.068	2.25	90	-1.55	102	7.7	-0.1	143	550	87	82
97	14.534	0.149	0.073	2.29	90	-2.95	96	7.6	-0.1	143	548	87	82
98	14.690	0.156	0.073	2.26	90	-0.53	100	7.5	-0.1	141	546	87	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.840	0.150	0.069	2.24	90	-0.36	99	7.4	-0.1	141	546	87	82
100	14.993	0.153	0.069	2.26	90	-1.07	101	7.2	-0.2	142	542	88	82
101	15.143	0.150	0.071	2.26	90	-2.85	98	7.1	-0.1	140	542	88	83
102	15.297	0.154	0.066	2.27	90	-0.22	104	7.0	-0.1	140	537	87	82
103	15.450	0.153	0.072	2.28	90	-2.18	99	6.9	-0.1	139	539	87	83
104	15.601	0.151	0.070	2.26	90	-1.17	99	6.8	-0.1	140	539	87	82
105	15.754	0.153	0.071	2.28	90	-1.12	100	6.7	-0.1	139	532	87	82
106	15.903	0.149	0.075	2.26	90	-0.53	94	6.5	-0.2	138	536	87	83
107	16.059	0.156	0.070	2.27	90	-0.24	102	6.5	0	139	536	87	82
108	16.209	0.150	0.069	2.26	90	-0.23	99	6.4	-0.1	138	535	87	83
109	16.362	0.153	0.066	2.27	90	-0.31	103	6.2	-0.2	138	533	87	82
110	16.512	0.150	0.067	2.26	91	-2.83	100	6.2	0	137	529	87	83
111	16.665	0.153	0.067	2.26	90	-2.73	102	6.1	-0.1	137	524	87	82
112	16.819	0.154	0.066	2.27	91	-0.28	104	6.0	-0.1	136	521	87	82
113	16.969	0.150	0.064	2.26	91	-1.9	102	5.9	-0.1	135	518	87	82
114	17.123	0.154	0.067	2.27	91	-0.43	103	5.8	-0.1	135	514	87	83
115	17.271	0.148	0.070	2.26	91	-1.52	97	5.7	-0.1	135	516	86	82
116	17.427	0.156	0.071	2.27	91	-2.86	101	5.5	-0.2	134	514	87	83
117	17.577	0.150	0.072	2.24	91	-0.18	96	5.5	0	134	507	86	83
118	17.730	0.153	0.069	2.24	91	-2.68	101	5.4	-0.1	134	507	86	84
119	17.881	0.151	0.069	2.25	91	-2.46	99	5.4	0	134	502	86	83
120	18.034	0.153	0.073	2.26	91	-0.33	98	5.4	0	133	501	86	83
121	18.187	0.153	0.072	2.24	91	-0.18	98	5.2	-0.2	133	493	86	83
122	18.337	0.150	0.068	2.25	91	-0.41	99	5.1	-0.1	133	495	86	82
123	18.491	0.154	0.065	2.26	91	-1.42	104	5.0	-0.1	132	488	86	83
124	18.640	0.149	0.069	2.24	91	-1.27	98	5.0	0	131	484	86	83
125	18.796	0.156	0.066	2.26	91	-2.18	105	4.8	-0.2	131	482	86	83
126	18.946	0.150	0.066	2.27	91	-2.96	100	4.8	0	131	476	86	82
127	19.098	0.152	0.067	2.26	91	-2.58	101	4.8	0	130	475	86	83
128	19.249	0.151	0.071	2.26	91	-0.73	97	4.7	-0.1	129	472	86	83
129	19.402	0.153	0.070	2.26	91	-2.94	99	4.6	-0.1	129	468	86	83
130	19.556	0.154	0.071	2.26	91	-0.22	99	4.6	0	128	465	86	82
131	19.706	0.150	0.070	2.26	91	-2.87	97	4.5	-0.1	128	464	86	83

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	19.860	0.154	0.074	2.26	91	-0.18	97	4.4	-0.1	128	460	85	83
133	20.009	0.149	0.070	2.24	91	-2.4	97	4.4	0	127	453	85	83
134	20.165	0.156	0.064	2.25	91	-0.31	106	4.3	-0.1	126	452	86	82
135	20.315	0.150	0.071	2.25	91	-1.75	96	4.3	0	126	448	86	83
136	20.467	0.152	0.073	2.24	91	-0.69	96	4.2	-0.1	125	445	86	83
137	20.618	0.151	0.067	2.24	91	-0.08	100	4.2	0	125	440	87	83
138	20.771	0.153	0.074	2.25	91	-1.01	96	4.1	-0.1	125	435	87	83
139	20.925	0.154	0.068	2.24	91	-2.98	101	4.0	-0.1	125	429	87	82
140	21.074	0.149	0.064	2.26	91	-0.24	101	4.0	0	124	425	87	82
141	21.229	0.155	0.064	2.24	91	-0.17	105	4.0	0	123	419	87	82
142	21.378	0.149	0.066	2.25	91	-0.79	99	3.9	-0.1	122	416	87	83
143	21.534	0.156	0.071	2.25	91	-0.28	100	3.8	-0.1	122	414	86	82
144	21.684	0.150	0.072	2.24	91	-2.61	95	3.8	0	122	410	87	82
145	21.837	0.153	0.069	2.25	92	-0.85	99	3.7	-0.1	121	407	86	82
146	21.988	0.151	0.065	2.24	92	-2.62	101	3.7	0	121	398	86	82
147	22.141	0.153	0.067	2.24	91	-0.34	101	3.6	-0.1	120	393	86	82
148	22.296	0.155	0.070	2.27	91	-0.86	100	3.6	0	119	390	86	82
149	22.444	0.148	0.062	2.22	91	-2.13	101	3.6	0	119	388	86	82
150	22.599	0.155	0.068	2.27	92	-0.14	101	3.5	-0.1	118	383	86	82
151	22.751	0.152	0.068	2.28	91	-1.11	99	3.5	0	118	378	86	82
152	22.907	0.156	0.066	2.30	91	-2.62	103	3.5	0	117	374	86	83
153	23.058	0.151	0.067	2.31	92	-0.59	99	3.4	-0.1	117	370	86	82
154	23.213	0.155	0.068	2.30	91	-1.08	101	3.4	0	116	367	85	82
155	23.369	0.156	0.074	2.31	92	-0.42	97	3.3	-0.1	115	363	85	82
156	23.520	0.151	0.068	2.31	92	-1	98	3.3	0	115	361	85	82
157	23.677	0.157	0.072	2.32	92	-1.23	99	3.2	-0.1	114	358	85	82
158	23.829	0.152	0.069	2.31	91	-0.07	98	3.1	-0.1	114	355	85	82
159	23.985	0.156	0.068	2.32	92	-1.56	101	3.2	0.1	114	352	85	82
160	24.138	0.153	0.067	2.31	91	-0.12	100	3.1	-0.1	114	350	86	82
161	24.293	0.155	0.072	2.29	91	-2.73	98	3.1	0	113	346	86	82
162	24.449	0.156	0.072	2.32	92	-0.26	98	3.1	0	112	345	86	82
163	24.599	0.150	0.065	2.31	92	-1.76	99	3.0	-0.1	112	341	86	82
164	24.757	0.158	0.070	2.29	92	-2.72	101	3.0	0	112	339	86	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	1	Technician:	ADK/SJB
		Date:	4/8/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	24.909	0.152	0.062	2.31	92	-0.47	103	3.0	0	112	336	86	82
166	25.064	0.155	0.065	2.30	92	-2.87	103	2.9	-0.1	111	332	87	82
167	25.218	0.154	0.065	2.30	92	-0.04	102	2.9	0	110	330	87	82
168	25.372	0.154	0.069	2.29	92	-0.35	99	2.9	0	110	326	86	82
169	25.527	0.155	0.071	2.28	92	-1.65	98	2.8	-0.1	110	325	86	82
170	25.677	0.150	0.070	2.29	92	-0.1	96	2.8	0	109	326	86	81
171	25.834	0.157	0.072	2.27	92	-0.66	99	2.8	0	110	325	86	82
172	25.985	0.151	0.067	2.30	92	-1.1	98	2.7	-0.1	108	324	86	81
173	26.140	0.155	0.065	2.28	92	-2.51	102	2.7	0	109	324	86	82
174	26.295	0.155	0.068	2.28	92	-0.27	100	2.7	0	108	324	86	81
175	26.447	0.152	0.072	2.30	92	-2.74	95	2.6	-0.1	108	323	85	82
176	26.602	0.155	0.065	2.31	92	-2.77	102	2.6	0	108	321	85	82
177	26.753	0.151	0.070	2.29	92	-0.4	96	2.6	0	108	320	85	81
178	26.910	0.157	0.068	2.30	92	-0.45	101	2.5	-0.1	107	319	85	82
179	27.061	0.151	0.070	2.30	92	-0.12	96	2.5	0	108	319	85	82
180	27.215	0.154	0.069	2.28	92	-1.19	99	2.5	0	108	318	85	82
181	27.369	0.154	0.069	2.27	92	-1.32	99	2.4	-0.1	107	316	85	82
182	27.522	0.153	0.073	2.29	92	-2.17	95	2.4	0	107	315	85	81
183	27.676	0.154	0.072	2.28	92	-0.98	97	2.3	-0.1	107	313	86	82
184	27.826	0.150	0.068	2.26	92	-0.45	97	2.3	0	107	313	86	82
185	27.983	0.157	0.070	2.27	92	-0.14	100	2.3	0	106	311	86	81
186	28.134	0.151	0.070	2.27	92	-0.25	96	2.3	0	106	310	86	82
187	28.287	0.153	0.067	2.27	92	-0.19	99	2.2	-0.1	106	309	86	82
188	28.439	0.152	0.064	2.25	92	-0.84	101	2.2	0	106	307	86	81
189	28.592	0.153	0.072	2.24	92	-2.2	96	2.2	0	106	306	86	81
190	28.746	0.154	0.070	2.26	92	-2.9	98	2.0	-0.2	106	305	86	81
Avg/Tot	28.746	0.151	0.069	2.25	89	-1.30	100			136	502	86	81.2

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.002		0.00	82	-1		85	0.000	0.00	0.04
1	0.100	0.098	2.32	82	-0.82	66	85	-0.030	1.15	0.11
2	0.250	0.150	2.28	82	-2.26	103	85	-0.070	4.73	0.18
3	0.394	0.144	2.25	82	-1.1	99	85	-0.070	10.28	0.72
4	0.542	0.148	2.22	82	-0.9	99	86	-0.050	9.38	0.46
5	0.684	0.142	2.22	82	-1.04	97	86	-0.060	8.27	0.21
6	0.832	0.148	2.22	82	-2.02	101	86	-0.070	6.82	0.18
7	0.973	0.141	2.65	82	-3.43	100	86	-0.070	5.56	0.17
8	1.121	0.148	2.23	82	-1.18	104	86	-0.070	5.69	0.15
9	1.264	0.143	2.22	82	-0.74	98	86	-0.060	5.97	0.27
10	1.412	0.148	2.22	83	-1.56	103	86	-0.070	7.90	0.14
11	1.556	0.144	2.22	83	-1.05	97	85	-0.080	9.27	0.37
12	1.703	0.147	2.20	83	-2.98	101	85	-0.070	9.01	0.27
13	1.846	0.143	2.21	83	-3.29	102	86	-0.070	9.75	0.22
14	1.993	0.147	2.20	84	-3.2	102	87	-0.070	8.69	0.14
15	2.137	0.144	2.24	84	-2.21	97	87	-0.070	8.26	0.14
16	2.286	0.149	2.71	84	-2.47	102	87	-0.070	8.07	0.10
17	2.430	0.144	2.26	84	-1.07	97	86	-0.080	7.89	0.18
18	2.579	0.149	2.24	85	-2.23	103	86	-0.080	7.32	0.18
19	2.724	0.145	2.25	85	-1.48	98	86	-0.070	7.38	0.13
20	2.872	0.148	2.25	85	-1.32	100	85	-0.070	6.71	0.13
21	3.017	0.145	2.25	86	-2.83	100	85	-0.070	5.61	0.12
22	3.165	0.148	2.24	86	-2.12	106	85	-0.080	4.89	0.17
23	3.310	0.145	2.22	86	-2.08	102	87	-0.100	7.70	0.28
24	3.457	0.147	2.22	87	-2.69	102	87	-0.100	10.49	0.66
25	3.601	0.144	2.17	87	-2.57	104	88	-0.080	12.72	1.43
26	3.749	0.148	2.24	87	-1.54	100	87	-0.100	12.61	1.22
27	3.893	0.144	2.19	88	-2.93	107	87	-0.080	12.00	1.78
28	4.039	0.146	2.17	88	-2.38	102	87	-0.080	6.87	0.37
29	4.184	0.145	2.18	88	-2.39	101	87	-0.080	8.22	0.25
30	4.328	0.144	2.16	89	-1.55	99	86	-0.090	9.46	0.23
31	4.475	0.147	2.27	89	-2.55	100	86	-0.090	10.05	0.19

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.624	0.149	2.30	89	-3.26	103	85	-0.090	9.99	0.14
33	4.772	0.148	2.28	90	-2.29	104	86	-0.090	10.04	0.13
34	4.921	0.149	2.27	90	-3.2	102	86	-0.090	11.07	0.19
35	5.069	0.148	2.28	90	-1.61	104	87	-0.090	10.82	0.12
36	5.218	0.149	2.27	91	-3.24	101	88	-0.090	11.23	0.11
37	5.364	0.146	2.27	91	-1.57	103	88	-0.090	11.14	0.11
38	5.514	0.150	2.27	91	-2.98	103	88	-0.100	11.02	0.15
39	5.660	0.146	2.27	92	-1.72	103	88	-0.090	11.09	0.12
40	5.811	0.151	2.26	92	-1.5	111	87	-0.090	11.26	0.12
41	5.957	0.146	2.25	92	-1.69	105	87	-0.100	11.18	0.15
42	6.107	0.150	2.25	92	-2.1	104	87	-0.080	11.39	0.14
43	6.253	0.146	2.25	93	-1.7	102	87	-0.090	11.45	0.13
44	6.405	0.152	2.26	93	-1.81	106	86	-0.090	11.40	0.16
45	6.551	0.146	2.25	94	-2.58	106	87	-0.090	11.32	0.18
46	6.702	0.151	2.26	94	-3.28	109	86	-0.090	11.49	0.14
47	6.847	0.145	2.25	94	-2.66	102	87	-0.090	11.41	0.17
48	6.998	0.151	2.26	94	-3.26	105	88	-0.100	11.45	0.15
49	7.145	0.147	2.27	95	-1.57	98	88	-0.100	11.33	0.10
50	7.295	0.150	2.24	95	-3.13	103	89	-0.090	11.33	0.12
51	7.441	0.146	2.25	95	-3.3	97	88	-0.100	11.32	0.12
52	7.591	0.150	2.25	95	-3.06	108	88	-0.100	11.19	0.13
53	7.738	0.147	2.26	96	-2.85	101	88	-0.080	11.21	0.11
54	7.888	0.150	2.25	96	-3.26	104	88	-0.090	11.04	0.13
55	8.035	0.147	2.25	96	-2.12	101	88	-0.090	11.10	0.15
56	8.185	0.150	2.23	96	-1.67	102	87	-0.090	11.22	0.14
57	8.333	0.148	2.25	97	-2.5	103	87	-0.100	11.21	0.21
58	8.482	0.149	2.24	97	-3.17	104	87	-0.090	11.40	0.21
59	8.630	0.148	2.24	97	-2.24	101	87	-0.090	11.50	0.18
60	8.779	0.149	2.24	97	-1.56	102	86	-0.090	11.43	0.22
61	8.928	0.149	2.25	98	-2.21	102	86	-0.090	11.22	0.23
62	9.076	0.148	2.26	98	-3.15	102	87	-0.100	11.38	0.22
63	9.226	0.150	2.25	98	-2.59	104	88	-0.090	11.44	0.25

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.373	0.147	2.24	98	-1.73	104	88	-0.100	11.35	0.26
65	9.522	0.149	2.23	98	-1.59	102	88	-0.080	11.43	0.23
66	9.670	0.148	2.24	98	-3.29	106	89	-0.100	11.41	0.25
67	9.820	0.150	2.24	98	-2.73	106	88	-0.090	11.35	0.23
68	9.966	0.146	2.22	99	-3.06	104	88	-0.100	11.33	0.21
69	10.117	0.151	2.22	99	-1.6	102	88	-0.090	11.33	0.22
70	10.264	0.147	2.23	99	-3.28	99	88	-0.090	11.18	0.17
71	10.415	0.151	2.24	100	-3.27	103	87	-0.100	11.03	0.14
72	10.561	0.146	2.24	100	-2.77	101	87	-0.100	10.60	0.14
73	10.712	0.151	2.23	100	-1.77	101	87	-0.090	10.65	0.11
74	10.859	0.147	2.23	100	-1.87	98	87	-0.100	10.45	0.11
75	11.010	0.151	2.23	100	-3.2	106	86	-0.110	10.34	0.12
76	11.155	0.145	2.25	100	-2.29	101	86	-0.100	10.71	0.09
77	11.306	0.151	2.22	101	-2.66	105	87	-0.090	10.80	0.14
78	11.453	0.147	2.23	101	-1.55	96	87	-0.080	10.68	0.11
79	11.603	0.150	2.23	101	-1.55	102	88	-0.080	10.50	0.08
80	11.750	0.147	2.22	101	-2.11	99	88	-0.080	10.19	0.05
81	11.900	0.150	2.21	101	-2.52	108	88	-0.070	9.90	0.03
82	12.049	0.149	2.24	101	-1.85	103	88	-0.090	9.53	0.06
83	12.198	0.149	2.23	102	-2.58	105	88	-0.090	9.33	0.04
84	12.347	0.149	2.21	102	-2.63	99	88	-0.080	9.25	0.03
85	12.495	0.148	2.22	102	-1.81	101	88	-0.090	8.91	0.03
86	12.645	0.150	2.24	102	-1.69	99	87	-0.080	8.73	0.03
87	12.793	0.148	2.22	102	-2.35	97	87	-0.080	8.58	0.03
88	12.942	0.149	2.23	102	-2.63	99	87	-0.090	8.34	0.02
89	13.090	0.148	2.23	102	-1.76	101	86	-0.080	8.30	0.02
90	13.240	0.150	2.23	102	-2.47	103	86	-0.080	8.22	0.04
91	13.387	0.147	2.23	102	-2.72	102	87	-0.080	8.10	0.04
92	13.540	0.153	2.25	103	-3.06	102	88	-0.080	8.28	0.01
93	13.687	0.147	2.24	103	-3.37	100	88	-0.080	7.98	0.05
94	13.840	0.153	2.25	103	-1.91	107	88	-0.070	8.03	0.05
95	13.987	0.147	2.25	103	-2.71	98	88	-0.080	8.13	0.04

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	14.138	0.151	2.24	103	-2.31	102	88	-0.080	8.00	0.06
97	14.286	0.148	2.23	103	-1.73	97	87	-0.090	7.96	0.05
98	14.437	0.151	2.24	103	-3.19	99	87	-0.080	7.95	0.04
99	14.585	0.148	2.23	103	-3.39	99	87	-0.080	7.84	0.01
100	14.737	0.152	2.23	103	-1.76	102	87	-0.070	7.89	0.03
101	14.887	0.150	2.24	104	-2.25	99	86	-0.070	7.99	0.02
102	15.036	0.149	2.24	104	-2.7	102	86	-0.080	7.96	0.02
103	15.187	0.151	2.26	104	-2.27	99	87	-0.080	7.87	0.07
104	15.335	0.148	2.24	104	-3.2	98	87	-0.090	7.79	0.10
105	15.487	0.152	2.24	104	-1.79	100	88	-0.080	7.78	0.09
106	15.634	0.147	2.24	104	-2.87	94	88	-0.080	7.80	0.07
107	15.786	0.152	2.24	104	-1.59	101	87	-0.080	7.82	0.07
108	15.934	0.148	2.24	104	-2.61	99	88	-0.100	7.66	0.12
109	16.087	0.153	2.23	105	-2.72	104	87	-0.080	7.51	0.10
110	16.235	0.148	2.24	105	-3.36	100	87	-0.080	7.45	0.10
111	16.386	0.151	2.24	105	-2.72	102	87	-0.100	7.06	0.16
112	16.534	0.148	2.22	105	-2.58	101	86	-0.070	6.96	0.15
113	16.686	0.152	2.25	105	-3.35	105	86	-0.070	6.93	0.14
114	16.834	0.148	2.23	105	-1.53	100	87	-0.070	7.05	0.10
115	16.985	0.151	2.23	105	-1.8	100	88	-0.070	7.10	0.08
116	17.135	0.150	2.24	105	-2.22	98	88	-0.080	7.01	0.09
117	17.285	0.150	2.23	105	-3.31	98	88	-0.080	6.71	0.12
118	17.436	0.151	2.24	105	-1.84	100	88	-0.080	6.59	0.14
119	17.584	0.148	2.25	105	-1.71	98	88	-0.060	6.37	0.14
120	17.736	0.152	2.23	105	-3.37	98	87	-0.070	6.38	0.14
121	17.883	0.147	2.24	105	-2.88	96	87	-0.070	6.45	0.10
122	18.037	0.154	2.24	106	-1.59	103	87	-0.100	6.47	0.10
123	18.184	0.147	2.23	106	-1.81	100	86	-0.070	6.47	0.09
124	18.337	0.153	2.24	106	-1.71	101	86	-0.070	6.11	0.13
125	18.485	0.148	2.24	106	-3.26	100	87	-0.070	5.93	0.13
126	18.636	0.151	2.24	106	-3.46	102	87	-0.070	5.86	0.12
127	18.785	0.149	2.25	106	-3.27	100	87	-0.070	5.83	0.15

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	18.936	0.151	2.23	106	-2.67	98	88	-0.070	5.77	0.19
129	19.086	0.150	2.24	106	-3.39	98	87	-0.070	5.72	0.21
130	19.237	0.151	2.23	106	-1.67	98	87	-0.070	5.55	0.20
131	19.387	0.150	2.24	106	-3.34	98	87	-0.070	5.60	0.21
132	19.537	0.150	2.23	106	-1.72	96	86	-0.080	5.40	0.22
133	19.687	0.150	2.24	106	-2.89	98	86	-0.080	5.57	0.21
134	19.836	0.149	2.24	106	-1.53	102	86	-0.070	5.35	0.25
135	19.988	0.152	2.23	106	-2.81	99	87	-0.070	5.45	0.22
136	20.137	0.149	2.23	106	-2.14	95	87	-0.060	5.38	0.25
137	20.289	0.152	2.24	106	-1.98	102	88	-0.060	4.91	0.23
138	20.438	0.149	2.23	106	-3.23	95	88	-0.070	4.67	0.32
139	20.590	0.152	2.25	106	-1.72	101	88	-0.050	4.73	0.34
140	20.737	0.147	2.24	106	-3.33	101	87	-0.050	4.60	0.40
141	20.889	0.152	2.23	107	-2.92	104	87	-0.060	4.82	0.37
142	21.038	0.149	2.24	107	-1.92	100	87	-0.060	4.74	0.40
143	21.190	0.152	2.24	107	-3.32	98	86	-0.080	4.63	0.39
144	21.340	0.150	2.24	107	-2.22	96	86	-0.060	4.76	0.39
145	21.491	0.151	2.25	107	-2.15	99	86	-0.070	4.28	0.48
146	21.641	0.150	2.24	107	-2.46	101	87	-0.080	4.00	0.54
147	21.790	0.149	2.24	107	-3.35	99	87	-0.070	3.93	0.58
148	21.942	0.152	2.24	107	-3.27	99	88	-0.050	4.16	0.52
149	22.091	0.149	2.24	107	-3.35	103	87	-0.060	4.03	0.50
150	22.244	0.153	2.23	107	-1.51	101	87	-0.070	3.82	0.59
151	22.392	0.148	2.22	107	-1.8	97	87	-0.050	3.73	0.61
152	22.544	0.152	2.25	107	-3.01	102	86	-0.060	3.69	0.58
153	22.692	0.148	2.23	107	-2.68	98	86	-0.060	3.71	0.61
154	22.844	0.152	2.24	107	-1.54	100	86	-0.060	3.69	0.61
155	22.993	0.149	2.23	107	-1.87	94	87	-0.060	3.78	0.59
156	23.145	0.152	2.22	107	-1.62	100	87	-0.070	3.72	0.60
157	23.295	0.150	2.23	107	-2.89	96	88	-0.060	3.67	0.61
158	23.445	0.150	2.23	107	-2.84	98	87	-0.060	3.67	0.62
159	23.595	0.150	2.21	107	-2.63	98	87	-0.060	3.75	0.59

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	23.743	0.148	2.19	107	-3.24	98	87	-0.060	3.47	0.66
161	23.894	0.151	2.19	107	-1.99	96	87	-0.050	3.66	0.61
162	24.040	0.146	2.18	107	-2.21	93	86	-0.050	3.58	0.62
163	24.190	0.150	2.15	107	-3.57	101	86	-0.060	3.33	0.63
164	24.335	0.145	2.12	107	-2.04	94	86	-0.060	3.31	0.62
165	24.482	0.147	2.09	107	-2.27	101	87	-0.070	3.32	0.63
166	24.626	0.144	2.07	107	-3.08	96	87	-0.050	3.34	0.63
167	24.772	0.146	2.04	108	-3.77	98	88	-0.040	3.43	0.60
168	24.913	0.141	2.00	107	-2.55	92	87	-0.060	3.39	0.60
169	25.055	0.142	1.94	108	-2.66	91	87	-0.040	3.23	0.63
170	25.194	0.139	1.89	107	-3.91	90	87	-0.070	3.43	0.58
171	25.336	0.142	2.18	108	-5.15	90	86	-0.070	3.32	0.58
172	25.484	0.148	2.11	107	-4.73	97	86	-0.050	3.44	0.55
173	25.628	0.144	2.05	108	-4.22	96	86	-0.050	3.53	0.49
174	25.774	0.146	1.99	108	-3.68	95	86	-0.050	3.51	0.53
175	25.920	0.146	2.32	108	-1.31	92	84	-0.040	3.64	0.48
176	26.074	0.154	2.29	107	-0.67	103	87	-0.070	3.38	0.52
177	26.226	0.152	2.29	108	-1.07	98	87	-0.050	3.47	0.51
178	26.378	0.152	2.30	108	-2.4	99	88	-0.040	3.48	0.52
179	26.531	0.153	2.30	108	-2.82	98	88	-0.060	3.68	0.43
180	26.681	0.150	2.29	108	-0.72	97	87	-0.050	3.64	0.50
181	26.837	0.156	2.30	108	-0.9	101	87	-0.050	3.40	0.55
182	26.987	0.150	2.30	107	-3.04	94	86	-0.050	3.43	0.55
183	27.141	0.154	2.30	108	-1.99	97	85	-0.070	3.41	0.58
184	27.291	0.150	2.30	108	-2.64	98	86	-0.040	3.39	0.58
185	27.445	0.154	2.26	108	-2.55	99	86	-0.050	3.37	0.55
186	27.596	0.151	2.26	108	-0.59	97	87	-0.060	3.25	0.59
187	27.747	0.151	2.26	108	-0.95	99	88	-0.060	3.38	0.54
188	27.900	0.153	2.27	108	-2.9	103	88	-0.050	3.46	0.51
189	28.049	0.149	2.26	108	-0.45	94	87	-0.060	3.22	0.51
Avg/Tot	28.203	0.148	2.22	100	-2.38	100			7.34	0.28

WOODSTOVE SURFACE TEMPERATURE DATA

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	1	Technician:	ADK/SJB
		Date:	4/8/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	78	77	77	80	77	77.8	N/A
1	78	78	77	80	77	78.0	N/A
2	81	80	78	80	77	79.2	N/A
3	92	90	80	82	78	84.4	N/A
4	104	103	84	85	79	91.0	N/A
5	117	116	88	90	81	98.4	N/A
6	130	129	92	95	84	106.0	N/A
7	142	141	97	102	88	114.0	N/A
8	156	154	102	109	93	122.8	N/A
9	170	168	110	116	98	132.4	N/A
10	181	181	118	123	104	141.4	N/A
11	193	194	126	132	109	150.8	N/A
12	206	207	134	141	115	160.6	N/A
13	221	220	141	150	120	170.4	N/A
14	235	233	149	161	125	180.6	N/A
15	249	247	158	172	131	191.4	N/A
16	261	260	166	183	136	201.2	N/A
17	273	273	174	193	142	211.0	N/A
18	285	286	181	204	148	220.8	N/A
19	296	299	189	213	154	230.2	N/A
20	307	310	197	222	160	239.2	N/A
21	319	321	206	230	166	248.4	N/A
22	329	330	214	237	172	256.4	N/A
23	338	338	221	244	178	263.8	N/A
24	347	346	230	252	183	271.6	N/A
25	355	354	238	262	189	279.6	N/A
26	366	363	246	273	195	288.6	N/A
27	378	372	254	289	202	299.0	N/A
28	389	382	262	305	208	309.2	N/A
29	397	390	269	318	215	317.8	N/A
30	403	394	275	330	220	324.4	N/A
31	409	395	280	341	226	330.2	N/A
32	414	396	285	353	231	335.8	N/A
33	420	398	289	364	236	341.4	N/A
34	425	399	292	375	240	346.2	N/A
35	431	400	295	384	244	350.8	N/A
36	436	402	298	397	248	356.2	N/A
37	441	405	301	407	252	361.2	N/A
38	447	407	303	417	255	365.8	N/A
39	452	411	306	428	259	371.2	N/A
40	457	414	308	439	262	376.0	N/A
41	462	417	310	446	264	379.8	N/A
42	466	421	312	454	268	384.2	N/A
43	470	424	314	463	271	388.4	N/A
44	475	428	316	471	274	392.8	N/A
45	479	432	318	479	277	397.0	N/A
46	483	436	321	486	279	401.0	N/A
47	488	438	324	491	282	404.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	492	440	324	503	283	408.4	N/A
49	496	442	322	502	284	409.2	N/A
50	500	445	320	499	284	409.6	N/A
51	503	447	318	498	285	410.2	N/A
52	505	449	316	493	287	410.0	N/A
53	508	451	315	488	288	410.0	N/A
54	510	453	313	485	290	410.2	N/A
55	511	455	312	481	291	410.0	N/A
56	513	457	311	477	292	410.0	N/A
57	515	458	310	473	294	410.0	N/A
58	516	459	309	469	295	409.6	N/A
59	518	461	308	469	297	410.6	N/A
60	519	462	308	467	299	411.0	N/A
61	521	463	307	464	301	411.2	N/A
62	523	465	307	461	303	411.8	N/A
63	525	467	307	462	305	413.2	N/A
64	526	468	307	461	307	413.8	N/A
65	529	470	307	459	309	414.8	N/A
66	530	472	308	458	311	415.8	N/A
67	532	473	308	458	314	417.0	N/A
68	534	475	308	457	316	418.0	N/A
69	536	477	309	456	318	419.2	N/A
70	538	479	310	458	321	421.2	N/A
71	540	480	310	456	322	421.6	N/A
72	542	482	311	456	325	423.2	N/A
73	545	483	312	456	327	424.6	N/A
74	547	485	313	455	329	425.8	N/A
75	549	486	313	453	331	426.4	N/A
76	551	488	315	452	333	427.8	N/A
77	552	489	316	451	335	428.6	N/A
78	553	491	316	450	338	429.6	N/A
79	556	494	318	448	340	431.2	N/A
80	557	496	318	447	341	431.8	N/A
81	558	499	319	446	344	433.2	N/A
82	560	502	320	444	346	434.4	N/A
83	561	504	321	440	347	434.6	N/A
84	562	507	321	436	350	435.2	N/A
85	563	510	323	432	351	435.8	N/A
86	563	512	322	426	353	435.2	N/A
87	563	513	324	421	355	435.2	N/A
88	563	515	324	417	357	435.2	N/A
89	562	516	324	412	358	434.4	N/A
90	562	516	324	408	359	433.8	N/A
91	561	516	325	402	362	433.2	N/A
92	560	517	325	396	363	432.2	N/A
93	559	516	323	391	364	430.6	N/A
94	557	516	325	388	366	430.4	N/A
95	556	516	326	385	367	430.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	1	Technician:	ADK/SJB
		Date:	4/8/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	554	516	325	380	368	428.6	N/A
97	554	516	326	377	370	428.6	N/A
98	552	516	325	373	371	427.4	N/A
99	551	515	326	370	372	426.8	N/A
100	550	515	325	368	373	426.2	N/A
101	549	516	326	365	373	425.8	N/A
102	548	515	326	361	375	425.0	N/A
103	546	514	327	358	376	424.2	N/A
104	545	515	326	357	377	424.0	N/A
105	544	515	327	354	377	423.4	N/A
106	543	515	326	350	379	422.6	N/A
107	542	516	328	350	379	423.0	N/A
108	541	516	328	346	379	422.0	N/A
109	539	517	328	344	380	421.6	N/A
110	538	518	329	341	382	421.6	N/A
111	536	517	329	340	381	420.6	N/A
112	534	518	329	338	382	420.2	N/A
113	532	518	330	335	383	419.6	N/A
114	531	518	330	333	384	419.2	N/A
115	530	518	330	330	383	418.2	N/A
116	528	517	329	328	385	417.4	N/A
117	526	517	330	325	384	416.4	N/A
118	524	517	330	322	384	415.4	N/A
119	522	516	331	320	383	414.4	N/A
120	521	516	331	317	383	413.6	N/A
121	518	515	331	314	383	412.2	N/A
122	517	515	331	313	383	411.8	N/A
123	515	514	330	310	382	410.2	N/A
124	515	513	330	308	382	409.6	N/A
125	514	512	330	305	381	408.4	N/A
126	513	511	330	303	380	407.4	N/A
127	512	510	329	300	381	406.4	N/A
128	510	509	328	297	380	404.8	N/A
129	508	508	328	295	379	403.6	N/A
130	506	507	327	292	379	402.2	N/A
131	503	506	326	289	379	400.6	N/A
132	501	505	325	286	379	399.2	N/A
133	498	504	325	284	378	397.8	N/A
134	495	503	324	281	378	396.2	N/A
135	493	500	322	278	379	394.4	N/A
136	490	499	322	275	378	392.8	N/A
137	487	497	321	273	378	391.2	N/A
138	485	495	320	271	378	389.8	N/A
139	482	493	319	268	378	388.0	N/A
140	480	491	317	267	377	386.4	N/A
141	477	489	316	266	377	385.0	N/A
142	475	487	316	263	376	383.4	N/A
143	472	484	315	259	376	381.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 1

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/8/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	469	482	314	256	376	379.4	N/A
145	465	479	313	254	376	377.4	N/A
146	463	476	313	251	374	375.4	N/A
147	461	473	312	249	374	373.8	N/A
148	457	469	312	246	373	371.4	N/A
149	454	465	310	244	373	369.2	N/A
150	451	461	309	241	374	367.2	N/A
151	449	457	308	238	373	365.0	N/A
152	445	452	306	236	372	362.2	N/A
153	442	448	304	234	371	359.8	N/A
154	438	444	303	232	370	357.4	N/A
155	435	440	301	229	370	355.0	N/A
156	432	436	299	228	369	352.8	N/A
157	429	432	297	225	369	350.4	N/A
158	426	428	296	222	369	348.2	N/A
159	423	425	294	220	368	346.0	N/A
160	420	422	292	218	366	343.6	N/A
161	418	419	291	216	367	342.2	N/A
162	415	416	289	213	365	339.6	N/A
163	413	412	287	211	365	337.6	N/A
164	411	409	286	209	364	335.8	N/A
165	408	406	285	207	364	334.0	N/A
166	405	403	283	205	364	332.0	N/A
167	403	400	282	204	363	330.4	N/A
168	400	397	281	203	362	328.6	N/A
169	398	395	280	201	362	327.2	N/A
170	396	392	278	199	361	325.2	N/A
171	394	389	277	199	360	323.8	N/A
172	391	387	276	197	360	322.2	N/A
173	390	384	275	197	358	320.8	N/A
174	388	382	275	194	358	319.4	N/A
175	386	380	274	193	358	318.2	N/A
176	385	378	274	192	357	317.2	N/A
177	383	376	273	192	355	315.8	N/A
178	382	374	272	190	355	314.6	N/A
179	381	372	272	189	354	313.6	N/A
180	380	371	271	189	353	312.8	N/A
181	379	369	271	187	353	311.8	N/A
182	378	367	270	186	353	310.8	N/A
183	377	366	269	185	352	309.8	N/A
184	376	365	269	185	351	309.2	N/A
185	375	363	268	184	351	308.2	N/A
186	373	362	267	183	350	307.0	N/A
187	373	361	267	183	350	306.8	N/A
188	372	359	266	183	349	305.8	N/A
189	371	358	266	182	349	305.2	N/A
Average	446	425	285	312	311	356	N/A

LAB SAMPLE DATA - ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	1	Technician:	ADK/SJB
		Date:	4/8/2019

TRAIN A (1st Hour)

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T129	92.9	88.6	4.3
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total	Total Particulate, mg:	4.3

TRAIN A (Post 1st hour)

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T130	183.3	89.6	4.8
B. Rear filter catch	Filter	T131		88.9	
C. Probe catch*	Probe	14A	116817.0	116816.8	0.2
D. O-Ring catch*	O-Ring	14A	3360.6	3360.2	0.4

Sub-Total	Total Particulate, mg:	5.4
Train A Aggregate	Total Particulate, mg:	**9.7**

TRAIN B

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T132/T135	272.0	176.1	8.3
B. Rear filter catch	Filter	T133		87.6	
C. Probe catch*	Probe	14B	116770.8	116770.8	0.0
D. O-Ring catch*	O-Ring	14B	3334.9	3334.6	0.3

Total Particulate, mg:	**8.6**

AMBIENT

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	T134	86.8	86.7	0.1

Total Particulate, mg:	**0.1**

*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight.

ASTM E3053 Wood Heater Run Sheets

Client: FPI Job Number: 19-469 Tracking #: 0025
Model: I2450 Run Number: 1 Test Date: 4/8/2019

Wood Heater Run Notes

Test Notes
Test Burn Start Time: 11:50
Air Control Setting: Fully Open

Time	Notes
0:00	Started with 1.7 lbs kindling and torch for 20 sec, door cracked
1:55	Door Closed
6:00	Added 2.7 lb of kindling & startup
21:20	Added remaining 2.6 lbs of start-up fuel
26:00	Leveled remaining coal bed, zeroed scale, loaded test fuel
46:00	Fan on high
60:00	Changed filter A
175:00	Changed filter B
190:00	Test end @ 2.1 lb

Test Burn End Time: 15:00

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 16.93 CO (%): 4.330
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	09:10	09:14	09:12	15:17	15:15	15:20
CO_2	0.00	10.04	16.93	0.12	9.72	16.49
CO	0.0000	2.480	4.330	-0.011	2.444	4.289

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

Technician Signature: [signature] Date: 4/8/2019

ASTM E3053 Wood Heater Run Sheets

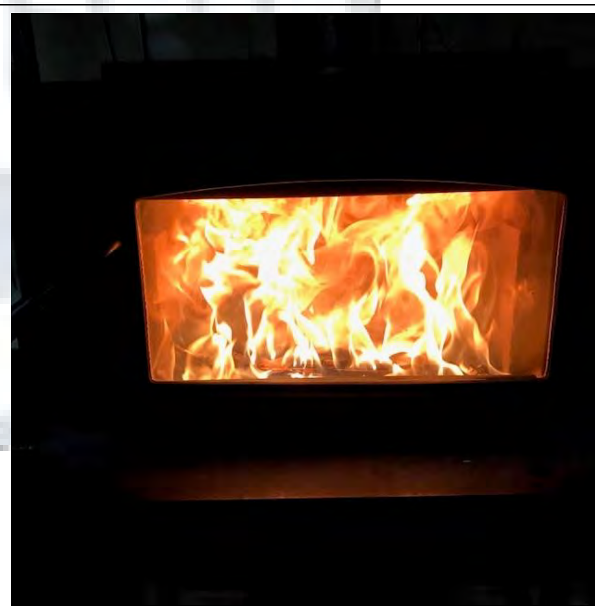
Client: FPI	Job Number: 19-469	Tracking #: 0025
Model: I2450	Run Number: 1	Test Date: 4/8/2019

Test Photos

Kindling Fuel Load

Start-up Fuel Load

High Fire Fuel Load



Residual Start-up Fuel Coal Bed

Technician Signature: ____________________ Date: 4/8/2019

ASTM E3053 Wood Heater Run Sheets

Client: FPI | Job Number: 19-469 | Tracking #: 0025
Model: I2450 | Run Number: 1 | Test Date: 4/8/2019

High Fire Fuel Loaded

Technician Signature: ______ Date: 4/8/2019

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 2 Data Summary

Client: FPI
Model: I2450
Job #: 19-469
Tracking #: 0025
Test Date: 4/9/2019

6/24/2021

Tecnician Signature | Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	2	Technician:	ADK/SJB
		Date:	4/9/2019

Burn Rate (kg/hr):	**1.10**

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	61.013	80.013	78.193	9.019
Average Gas Velocity in Dilution Tunnel (ft/sec)				17.06
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)				11152.5
Average Gas Meter Temperature (°F)	80.5	90.3	105.0	87.4
Total Sample Volume (dscf)	59.936	78.023	73.951	8.840
Average Tunnel Temperature (°F)				103.0
Total Time of Test (min)				525
Total Particulate Catch (mg)	0.1	5.9	5.0	3.0
Particulate Concentration, dry-standard (g/dscf)	0.0000017	0.0000756	0.0000676	0.0003393
Total PM Emissions (g)	0.16	7.22	6.44	3.77
Particulate Emission Rate (g/hr)	0.02	0.82	0.74	3.77
Emissions Factor (g/kg)	-	0.75	0.67	-
Difference from Average Total Particulate Emissions (g)	-	0.39	0.39	-
Difference from Average Emissions Factor (g/kg)	-	0.04	0.04	-

Final Average Results	
Total Particulate Emissions (g)	6.83
Particulate Emission Rate (g/hr)	0.78
Emissions Factor (g/kg)	0.71
HHV Efficiency (%)	68.2%
LHV Efficiency (%)	73.0%
CO Emissions (g/min)	1.43

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 84 / Max: 88	OK
Face Velocity	< 30 ft/min	9.4	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min: 78 / Max: 84	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	CHECK 10 MIN. INTERVAL PRO-RATES

B415.1 Efficiency Results

Manufacturer:	FPI
Model:	I2450
Date:	04/09/19
Run:	2
Control #:	19-469
Test Duration:	525
Output Category:	Low

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	68.2%	73.0%
Combustion Efficiency	95.0%	95.0%
Heat Transfer Efficiency	71.8%	76.8%

Output Rate (kJ/h)	14,936	14,169	**(Btu/h)**
Burn Rate (kg/h)	1.10	2.42	**(lb/h)**
Input (kJ/h)	21,891	20,766	**(Btu/h)**

Test Load Weight (dry kg)	9.60	21.15	**dry lb**
MC wet (%)	17.70		
MC dry (%)	21.51		
Particulate (g)	6.83		
CO (g)	751		
Test Duration (h)	8.75		

Emissions	Particulate	CO
g/MJ Output	0.05	5.74
g/kg Dry Fuel	0.71	78.24
g/h	0.78	85.81
g/min	0.01	1.43
lb/MM Btu Output	0.12	13.35

Air/Fuel Ratio (A/F)	23.47

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

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #	0025
Run #:	2	Technician:	ADK/SJB
		Date:	4/9/2019

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.24		
Target Load Weight (lbs):	22.40		
Total Load Weight Range (lbs):	21.30	to	23.50
Core Load Weight Range (lbs):	10.10	to	14.60
Remainder Load Weight Range (lbs):	7.80	to	12.30
Core Load Piece Range (lbs):	3.40	to	5.60
Remainder Load Piece Range (lbs):	2.20	to	12.30
Max Allowable Kindling Weight (lbs):	4.29		
Max Allowable Start-up Fuel Weight (lbs):	6.44		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	3.40	In Range	20.7	19.1	19.5	19.8	In Range	2.84	1.29
2	17.00	4.50	In Range	24.8	22.4	19.8	22.3	In Range	3.68	1.67
3	17.00	3.66	In Range	20.9	19.5	21.0	20.5	In Range	3.04	1.38
Core Load Wt. (lbs)		11.56	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	2.47	In Range	23.6	22.6	23.4	23.2	In Range	2.00	0.91
2	17.00	4.34	In Range	22.3	20.2	19.7	20.7	In Range	3.59	1.63
3	17.00	3.09	In Range	22.8	19.9	21.5	21.4	In Range	2.55	1.15
Remainder Load (lbs)		9.90	In Range							

Total Load Weight (lbs):	21.46	In Range		
Core Load % of Total Weight:	54%	In Range	45-65%	
Remainder % of Total Weight:	46%	In Range	35-55%	
Total Load % of Target Weight:	96%	In Range	95-105%	
Actual Fuel Loading Density (lb/ft3):	9.6			
Total Load Average Moisture Conent (%DB):	21.2	In Range	19-25%	
Total Load Average Moisture Conent (%WB):	17.5			
Total Test Load Weight (dry basis):	17.70 lbs		8.03	kg

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
3.04	In Range	10	10	10	10.0	In Range	2.76	1.25

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.08	In Range	19.7	22.3	18.6	20.2	In Range	3.39	1.54

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.1	to	4.3	
Actual Residual Start-up Fuel Weight (lb):		2.1		In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #	0025
Run #:	2	Technician:	ADK/SJB
		Date:	4/9/2019

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.24		
Target Load Weight (lbs):	26.88		
Total Load Weight Range (lbs):	25.54	to	28.22
Core Load Weight Range (lbs):	12.10	to	17.47
Remainder Load Weight Range (lbs):	9.41	to	14.78
Core Load Piece Range (lbs):	4.03	to	6.72
Remainder Load Piece Range (lbs):	2.69	to	8.06

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	4.10	In Range	18.2	19.7	18.3	18.7	In Range	3.45	1.57
2	17.00	6.19	In Range	24.2	24.2	24.2	24.2	In Range	4.98	2.26
3	17.00	4.23	In Range	22.1	21.0	21.6	21.6	In Range	3.48	1.58
Core Load Wt. (lbs)		14.52	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	7.98	In Range	22.9	21.0	21.4	21.8	In Range	6.55	2.97
2	17.00	3.31	In Range	19.6	18.6	20.2	19.5	In Range	2.77	1.26
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		11.29	In Range							

Remainder Load Small/Large Piece Weight Ratio:	41%	In Range	≤ 67%
Total Load Weight (lbs):	25.81	In Range	
Core Load % of Total Weight:	56%	In Range	45-65%
Remainder % of Total Weight:	44%	In Range	35-55%
Total Load % of Target Weight:	96%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	11.5		
Total Load Average Moisture Conent (%DB):	21.5	In Range	19-25%
Total Load Average Moisture Conent (%WB):	17.7		
Total Test Load Weight (dry basis):	21.24 lbs		9.63 kg

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	2.6	to	5.1	
Actual Charcoal Bed Wt. (lb):		4.2		In Range

TEST END POINT

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

Total Fuel Burned During Test Run:	25.8 lbs, wet basis
	21.2 lbs, dry basis
	9.63 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	2	Technician:	ADK/SJB
Test Start Time:		Date:	4/9/2019
Test Type:	Low Fire		

Recording Interval (min):	1			
Total Sampling Time (min):	525			
Meter Box γ Factor:	1.004 (A)			
Meter Box γ Factor:	1.000 (B)			
Meter Box γ Factor:	0.999 (Ambient)			

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.12	30.14	30.13
Relative Humidity (%)	26.5	27.8	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		61.013 ft^3	

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/5/2019

Sample Train Post-Test Leak Checks

(A)	0.002	cfm @	-13	in. Hg
(B)	0.000	cfm @	-11	in. Hg
(Ambient)	0.000	cfm @		in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.054	85
2	0.066	85
3	0.074	85
4	0.060	85
5	0.060	85
6	0.068	85
7	0.062	85
8	0.062	85
Center	0.070	85

Static Pressure: -0.240 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	16.97	ft/sec
V_{scent}:	17.76	ft/sec
F_p:	0.955	[ratio]
Initial Tunnel Flow:	189.8	scf/min

TEST FUEL PROPERTIES

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

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

WOODSTOVE PREBURN DATA

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	2	Technician:	ADK/SJB
		Date:	4/9/2019

Recording Interval (min):	1
Run Time (min):	125

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
0	1.8	-0.001	78	78	78	79	77	78.0	80	77
1	1.7	-0.039	78	78	78	79	77	78.0	145	77
2	1.4	-0.074	82	80	78	80	77	79.4	324	77
3	1.2	-0.058	95	87	81	81	78	84.4	420	77
4	1.0	-0.062	109	98	85	83	78	90.6	398	77
5	0.8	-0.056	122	113	89	87	79	98.0	384	77
6	0.7	-0.069	135	129	94	91	81	106.0	373	77
7	0.6	-0.064	148	145	99	96	83	114.2	358	77
8	0.5	-0.041	159	159	105	102	87	122.4	346	73
9	3.0	-0.060	169	173	111	108	91	130.4	353	72
10	2.7	-0.061	179	184	118	114	95	138.0	443	72
11	2.4	-0.062	190	194	125	120	100	145.8	412	71
12	2.3	-0.069	201	204	133	127	105	154.0	447	71
13	2.1	-0.066	214	214	140	135	110	162.6	480	71
14	1.9	-0.064	229	226	147	144	115	172.2	502	71
15	1.7	-0.083	245	239	154	154	120	182.4	525	71
16	1.5	-0.087	262	253	161	165	126	193.4	535	71
17	1.4	-0.081	279	266	168	177	132	204.4	537	70
18	1.1	-0.085	296	280	177	191	139	216.6	542	70
19	0.9	-0.078	312	294	187	205	145	228.6	535	70
20	0.8	-0.081	328	308	197	219	151	240.6	504	70
21	3.4	-0.074	342	321	207	232	159	252.2	544	70
22	3.2	-0.082	354	333	217	244	165	262.6	562	70
23	3.0	-0.083	365	343	227	254	171	272.0	560	70
24	2.7	-0.082	375	352	237	265	177	281.2	584	69
25	2.6	-0.080	384	361	245	275	183	289.6	595	69
26	2.3	-0.081	395	370	254	287	189	299.0	604	69
27	13.8	-0.088	405	380	262	302	198	309.4	667	69
28	23.1	-0.074	416	391	274	315	204	320.0	512	69
29	23.0	-0.064	422	399	282	324	210	327.4	476	68
30	22.8	-0.081	423	403	289	329	216	332.0	494	68
31	22.6	-0.080	422	404	294	332	221	334.6	528	68
32	22.4	-0.079	421	404	299	337	227	337.6	549	68
33	22.2	-0.087	420	403	302	341	231	339.4	572	67
34	22.0	-0.089	421	402	305	345	236	341.8	585	67
35	21.7	-0.103	423	403	308	351	240	345.0	594	67
36	21.5	-0.087	426	405	309	358	244	348.4	597	67
37	21.2	-0.084	429	407	311	366	247	352.0	604	67
38	21.0	-0.087	433	409	312	372	250	355.2	620	67
39	20.7	-0.094	438	412	313	381	254	359.6	632	66
40	20.5	-0.096	442	416	313	387	257	363.0	630	66
41	20.2	-0.098	447	420	315	396	260	367.6	635	66
42	20.0	-0.087	452	423	316	404	263	371.6	645	66
43	19.7	-0.105	457	428	317	412	266	376.0	651	65

WOODSTOVE PREBURN DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

Recording Interval (min): 1
Run Time (min): 125

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
44	19.4	-0.093	463	432	318	420	269	380.4	657	65
45	19.2	-0.092	468	438	320	430	273	385.8	663	66
46	18.9	-0.095	473	442	321	438	275	389.8	664	66
47	18.6	-0.104	479	444	324	447	277	394.2	657	66
48	18.4	-0.097	484	447	322	454	278	397.0	657	66
49	18.2	-0.100	489	450	319	458	279	399.0	667	66
50	17.8	-0.093	494	454	317	460	281	401.2	665	66
51	17.6	-0.099	499	458	315	459	282	402.6	665	65
52	17.3	-0.089	504	461	312	458	283	403.6	666	65
53	17.0	-0.091	508	465	311	457	284	405.0	673	65
54	16.7	-0.089	512	468	309	456	286	406.2	686	65
55	16.4	-0.088	515	471	308	454	287	407.0	676	65
56	16.2	-0.096	519	474	307	455	288	408.6	671	65
57	15.9	-0.075	522	477	304	456	290	409.8	680	65
58	15.6	-0.089	526	480	305	456	291	411.6	683	65
59	15.4	-0.101	528	482	305	456	293	412.8	681	65
60	15.1	-0.087	532	485	304	456	295	414.4	672	65
61	14.8	-0.091	535	487	304	455	296	415.4	667	65
62	14.6	-0.088	538	490	304	458	297	417.4	660	65
63	14.3	-0.090	541	492	305	457	299	418.8	659	65
64	14.1	-0.087	543	494	305	457	300	419.8	661	65
65	13.9	-0.087	546	497	305	457	302	421.4	657	65
66	13.6	-0.093	548	499	305	456	304	422.4	651	65
67	13.4	-0.094	550	501	306	457	305	423.8	645	65
68	13.1	-0.095	552	503	307	457	307	425.2	644	65
69	12.9	-0.086	554	505	308	457	309	426.6	644	65
70	12.7	-0.092	556	507	308	456	310	427.4	642	65
71	12.4	-0.086	558	509	310	454	312	428.6	642	65
72	12.3	-0.086	560	511	311	454	314	430.0	642	65
73	11.9	-0.092	561	513	311	455	316	431.2	640	65
74	11.7	-0.084	563	515	312	454	318	432.4	634	65
75	11.5	-0.088	565	517	314	452	319	433.4	639	65
76	11.3	-0.086	566	519	315	451	321	434.4	635	65
77	11.0	-0.087	568	521	316	454	323	436.4	631	65
78	10.8	-0.103	570	523	318	453	324	437.6	631	65
79	10.7	-0.093	571	525	319	452	327	438.8	635	65

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	2	Technician:	ADK/SJB
		Date:	4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.047		0.069	0.01	85	-0.09		25.7		134	451	84	83
1	0.184	0.137	0.070	2.23	85	-2.27	94	26.1	0.4	151	407	84	83
2	0.330	0.146	0.075	2.20	85	-2.25	95	25.4	-0.7	138	495	85	82
3	0.477	0.147	0.065	2.21	85	-0.86	104	25.2	-0.2	144	586	85	82
4	0.626	0.149	0.067	2.31	85	-0.04	104	24.9	-0.3	148	637	86	82
5	0.776	0.150	0.063	2.29	85	-2.19	108	24.6	-0.3	151	655	86	82
6	0.921	0.145	0.068	2.22	85	-1.13	100	24.3	-0.3	145	618	86	82
7	1.070	0.149	0.068	2.20	85	-0.17	103	24.0	-0.3	143	598	86	82
8	1.215	0.145	0.072	2.18	85	-0.02	97	23.8	-0.2	142	591	87	82
9	1.365	0.150	0.070	2.28	86	-0.54	102	23.6	-0.2	143	593	87	82
10	1.512	0.147	0.069	2.28	85	-1	100	23.4	-0.2	142	590	87	82
11	1.663	0.151	0.069	2.26	86	-0.21	103	23.2	-0.2	142	593	87	82
12	1.807	0.144	0.081	2.25	85	-0.22	91	22.9	-0.3	142	602	87	82
13	1.958	0.151	0.065	2.24	86	-1.7	106	22.7	-0.2	144	620	87	82
14	2.102	0.144	0.070	2.13	86	-3.44	97	22.5	-0.2	140	570	87	82
15	2.253	0.151	0.065	2.19	86	-3.29	105	22.2	-0.3	136	554	87	83
16	2.398	0.145	0.067	2.17	86	-2.89	100	22.0	-0.2	135	547	87	82
17	2.550	0.152	0.067	3.38	86	-1.24	104	21.8	-0.2	134	546	85	82
18	2.726	0.176	0.068	2.17	86	-0.98	120	21.6	-0.2	134	540	86	82
19	2.876	0.150	0.067	2.33	86	-0.82	103	21.4	-0.2	132	537	87	82
20	3.028	0.152	0.070	2.30	87	-1.52	102	21.3	-0.1	132	535	87	82
21	3.176	0.148	0.072	2.32	87	-1.39	98	21.1	-0.2	131	537	87	83
22	3.328	0.152	0.067	2.29	87	-1.64	104	20.9	-0.2	131	534	87	82
23	3.475	0.147	0.067	2.30	87	-1.74	100	20.8	-0.1	130	534	87	82
24	3.628	0.153	0.072	2.28	87	-1.49	101	20.6	-0.2	130	531	87	82
25	3.776	0.148	0.071	2.29	87	-1.64	98	20.3	-0.3	130	525	87	83
26	3.930	0.154	0.070	2.31	87	-1.73	103	20.3	0	129	523	87	82
27	4.078	0.148	0.066	2.31	87	-0.48	102	20.1	-0.2	129	521	87	82
28	4.230	0.152	0.065	2.31	87	-1.58	105	20.0	-0.1	128	519	87	82
29	4.379	0.149	0.066	2.29	88	-1.75	102	19.8	-0.2	129	517	87	83
30	4.529	0.150	0.061	2.28	88	-1.78	107	19.6	-0.2	130	515	87	83
31	4.681	0.152	0.067	2.27	88	-1.04	104	19.5	-0.1	128	512	87	82
32	4.831	0.150	0.071	2.29	88	-0.55	99	19.4	-0.1	128	507	86	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.984	0.153	0.072	2.31	88	-1.24	101	19.2	-0.2	128	506	87	83
34	5.131	0.147	0.065	2.29	88	-1.35	102	19.0	-0.2	128	506	86	82
35	5.285	0.154	0.068	2.29	88	-1.13	104	18.9	-0.1	128	504	86	82
36	5.432	0.147	0.070	2.29	88	-1.38	98	18.7	-0.2	126	501	86	82
37	5.587	0.155	0.071	2.29	88	-0.6	102	18.6	-0.1	126	502	86	82
38	5.735	0.148	0.067	2.29	88	-1.39	101	18.4	-0.2	126	500	86	82
39	5.889	0.154	0.074	2.31	88	-0.68	100	18.2	-0.2	126	499	86	82
40	6.037	0.148	0.069	2.30	88	-1.51	99	18.1	-0.1	128	499	86	83
41	6.189	0.152	0.067	2.31	89	-1.7	103	18.0	-0.1	127	496	86	83
42	6.340	0.151	0.071	2.29	88	-0.65	100	17.8	-0.2	125	495	86	82
43	6.492	0.152	0.069	2.29	88	-0.54	102	17.6	-0.2	126	493	85	82
44	6.645	0.153	0.068	2.27	89	-1.89	103	17.5	-0.1	125	491	85	82
45	6.793	0.148	0.071	2.31	89	-1.63	97	17.3	-0.2	125	489	85	82
46	6.947	0.154	0.069	2.28	89	-0.8	103	17.3	0	124	487	85	82
47	7.094	0.147	0.072	2.28	89	-1.61	96	17.1	-0.2	125	487	85	82
48	7.250	0.156	0.067	2.30	89	-1.82	106	16.9	-0.2	124	485	85	83
49	7.398	0.148	0.071	2.30	89	-0.99	97	16.8	-0.1	124	483	85	83
50	7.552	0.154	0.068	2.31	89	-0.49	104	16.6	-0.2	124	483	86	83
51	7.701	0.149	0.069	2.29	89	-1	100	16.5	-0.1	125	480	86	82
52	7.853	0.152	0.065	2.29	90	-1.62	104	16.3	-0.2	124	478	86	82
53	8.005	0.152	0.064	2.27	89	-1.11	105	16.2	-0.1	124	479	87	82
54	8.156	0.151	0.072	2.29	89	-1.67	99	16.1	-0.1	123	477	87	82
55	8.310	0.154	0.071	2.32	89	-1.67	101	15.9	-0.2	123	476	87	82
56	8.458	0.148	0.068	2.31	90	-0.74	99	15.8	-0.1	122	470	87	82
57	8.612	0.154	0.072	2.30	90	-0.67	100	15.6	-0.2	122	466	87	82
58	8.762	0.150	0.065	2.30	90	-0.91	103	15.5	-0.1	122	466	87	82
59	8.917	0.155	0.060	2.31	90	-0.5	111	15.4	-0.1	122	463	87	82
60	9.066	0.149	0.066	2.31	89	-1.61	101	15.3	-0.1	121	461	86	82
61	9.219	0.153	0.073	2.33	90	-0.28	99	15.1	-0.2	122	459	86	83
62	9.370	0.151	0.069	2.31	90	-0.85	100	15.0	-0.1	121	458	86	82
63	9.523	0.153	0.068	2.32	90	-1.65	102	14.9	-0.1	121	456	87	83
64	9.678	0.155	0.065	2.33	90	-0.73	106	14.8	-0.1	120	454	87	82
65	9.827	0.149	0.072	2.31	90	-1.83	97	14.6	-0.2	121	453	87	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.981	0.154	0.068	2.30	90	-0.91	103	14.5	-0.1	119	451	86	82
67	10.132	0.151	0.070	2.32	90	-0.89	100	14.4	-0.1	120	450	86	84
68	10.287	0.155	0.067	2.29	90	-1.01	104	14.2	-0.2	120	446	86	82
69	10.435	0.148	0.072	2.31	90	-1.76	96	14.2	0	119	445	87	82
70	10.588	0.153	0.066	2.28	90	-1.07	104	14.1	-0.1	119	444	86	82
71	10.740	0.152	0.076	2.29	90	-1.75	96	13.9	-0.2	120	441	86	82
72	10.891	0.151	0.072	2.29	90	-1.4	98	13.8	-0.1	119	441	86	82
73	11.045	0.154	0.066	2.30	90	-0.5	105	13.7	-0.1	120	440	86	82
74	11.193	0.148	0.069	2.30	90	-1.74	98	13.6	-0.1	119	439	86	82
75	11.347	0.154	0.065	2.29	90	-1.01	105	13.5	-0.1	118	438	85	83
76	11.497	0.150	0.069	2.30	90	-1.02	100	13.4	-0.1	119	438	85	82
77	11.652	0.155	0.064	2.29	91	-0.46	107	13.1	-0.3	119	438	85	82
78	11.801	0.149	0.066	2.28	91	-0.49	101	13.1	0	119	438	85	82
79	11.954	0.153	0.075	2.28	90	-0.43	97	13.0	-0.1	118	437	85	82
80	12.104	0.150	0.078	2.28	90	-1.73	94	12.9	-0.1	118	436	85	82
81	12.257	0.153	0.067	2.29	91	-1.63	103	12.8	-0.1	119	437	85	83
82	12.410	0.153	0.068	2.29	91	-0.49	102	12.7	-0.1	117	437	86	82
83	12.560	0.150	0.070	2.30	91	-0.99	99	12.5	-0.2	118	436	86	82
84	12.714	0.154	0.073	2.28	91	-1.53	99	12.4	-0.1	118	437	86	82
85	12.863	0.149	0.066	2.27	90	-1.93	101	12.1	-0.3	117	438	86	82
86	13.018	0.155	0.068	2.28	91	-0.85	103	12.1	0	118	439	86	82
87	13.168	0.150	0.065	2.29	90	-1.78	102	12.1	0	117	438	87	82
88	13.321	0.153	0.062	2.29	91	-1.79	107	12.0	-0.1	118	438	86	83
89	13.471	0.150	0.066	2.26	90	-0.62	102	11.9	-0.1	117	437	86	82
90	13.623	0.152	0.069	2.28	91	-1.79	100	11.8	-0.1	117	437	86	82
91	13.777	0.154	0.078	2.27	91	-1.79	96	11.6	-0.2	118	437	86	82
92	13.927	0.150	0.068	2.28	91	-1.53	100	11.5	-0.1	118	438	86	83
93	14.080	0.153	0.072	2.29	91	-1.7	99	11.4	-0.1	117	439	86	82
94	14.228	0.148	0.065	2.26	91	-0.51	101	11.3	-0.1	117	437	86	82
95	14.384	0.156	0.066	2.28	91	-1.89	105	11.2	-0.1	117	439	86	82
96	14.533	0.149	0.068	2.26	91	-1.62	99	11.1	-0.1	117	439	86	82
97	14.687	0.154	0.065	2.29	91	-1.64	105	11.0	-0.1	117	439	86	82
98	14.836	0.149	0.068	2.25	91	-1.79	99	10.9	-0.1	117	440	85	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.988	0.152	0.068	2.28	91	-1.36	101	10.6	-0.3	117	441	85	82
100	15.140	0.152	0.068	2.29	91	-0.78	101	10.5	-0.1	118	440	85	82
101	15.291	0.151	0.065	2.28	91	-0.46	103	10.5	0	117	441	85	82
102	15.445	0.154	0.070	2.25	91	-1.48	101	10.4	-0.1	117	441	85	82
103	15.593	0.148	0.070	2.26	91	-1.2	97	10.3	-0.1	117	438	85	82
104	15.747	0.154	0.060	2.26	91	-1.23	109	10.2	-0.1	116	436	86	82
105	15.896	0.149	0.059	2.28	91	-1.55	106	10.1	-0.1	116	430	86	82
106	16.050	0.154	0.067	2.27	91	-0.57	103	9.9	-0.2	117	428	86	82
107	16.200	0.150	0.068	2.25	91	-1.45	100	9.8	-0.1	116	424	86	82
108	16.352	0.152	0.065	2.26	91	-1.04	103	9.7	-0.1	115	421	86	82
109	16.502	0.150	0.067	2.26	91	-0.51	100	9.7	0	115	416	86	82
110	16.655	0.153	0.070	2.26	91	-1.85	100	9.5	-0.2	115	416	87	83
111	16.807	0.152	0.070	2.26	91	-1.38	100	9.6	0.1	116	414	87	82
112	16.957	0.150	0.067	2.27	91	-1.47	100	9.5	-0.1	115	412	86	82
113	17.110	0.153	0.071	2.24	91	-0.55	100	9.4	-0.1	115	410	86	82
114	17.259	0.149	0.068	2.27	91	-1.84	99	9.3	-0.1	115	407	86	82
115	17.414	0.155	0.070	2.25	91	-1.84	101	9.2	-0.1	114	405	86	82
116	17.563	0.149	0.064	2.27	91	-1.51	102	9.1	-0.1	114	405	86	82
117	17.717	0.154	0.068	2.29	91	-0.75	102	9.0	-0.1	113	402	86	82
118	17.866	0.149	0.076	2.24	91	-1.39	94	9.0	0	113	401	86	82
119	18.018	0.152	0.066	2.26	91	-0.72	102	8.8	-0.2	114	401	86	82
120	18.171	0.153	0.061	2.27	91	-1.09	107	8.8	0	113	397	85	82
121	18.322	0.151	0.069	2.26	91	-1.33	99	8.7	-0.1	113	396	85	82
122	18.475	0.153	0.068	2.26	91	-1.44	102	8.7	0	113	393	85	82
123	18.623	0.148	0.065	2.25	91	-0.59	100	8.6	-0.1	113	390	85	82
124	18.777	0.154	0.074	2.26	91	-0.75	98	8.4	-0.2	113	387	85	82
125	18.927	0.150	0.067	2.28	91	-0.69	100	8.4	0	112	385	85	82
126	19.081	0.154	0.065	2.27	91	-0.66	104	8.4	0	111	382	85	82
127	19.231	0.150	0.077	2.26	91	-1.77	93	8.3	-0.1	111	379	86	82
128	19.384	0.153	0.069	2.26	92	-0.6	100	8.3	0	111	378	86	82
129	19.534	0.150	0.069	2.26	91	-1.23	99	8.1	-0.2	112	375	86	82
130	19.687	0.153	0.070	2.24	91	-1.91	100	8.1	0	111	373	86	82
131	19.839	0.152	0.070	2.25	91	-1.7	99	8.1	0	111	371	86	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	19.990	0.151	0.071	2.27	92	-0.66	98	8.0	-0.1	111	367	86	82
133	20.143	0.153	0.070	2.26	91	-0.47	100	7.9	-0.1	110	366	86	82
134	20.291	0.148	0.067	2.26	91	-0.67	99	7.9	0	110	365	86	81
135	20.447	0.156	0.069	2.25	92	-1.11	102	7.8	-0.1	110	361	86	81
136	20.596	0.149	0.068	2.26	91	-1.87	99	7.6	-0.2	109	358	86	82
137	20.750	0.154	0.070	2.27	92	-1.56	100	7.7	0.1	109	357	86	82
138	20.900	0.150	0.065	2.27	92	-1.49	101	7.6	-0.1	109	354	86	81
139	21.052	0.152	0.072	2.26	91	-0.64	98	7.5	-0.1	108	352	86	82
140	21.205	0.153	0.066	2.25	91	-1.25	103	7.5	0	108	350	86	82
141	21.356	0.151	0.065	2.26	92	-0.86	102	7.4	-0.1	108	350	85	82
142	21.508	0.152	0.071	2.26	92	-1.74	98	7.4	0	108	347	85	82
143	21.657	0.149	0.067	2.28	92	-0.79	99	7.3	-0.1	107	345	85	81
144	21.812	0.155	0.067	2.27	91	-0.66	103	7.2	-0.1	108	344	85	82
145	21.961	0.149	0.065	2.26	92	-1.68	100	7.1	-0.1	107	343	85	81
146	22.116	0.155	0.068	2.27	92	-1.23	102	7.1	0	107	341	86	81
147	22.264	0.148	0.071	2.27	92	-0.43	95	7.0	-0.1	107	341	86	82
148	22.417	0.153	0.074	2.26	91	-1.89	97	6.9	-0.1	106	340	86	82
149	22.570	0.153	0.067	2.26	91	-1.01	102	6.8	-0.1	107	339	86	82
150	22.721	0.151	0.069	2.27	92	-0.56	99	6.9	0.1	106	338	86	82
151	22.875	0.154	0.068	2.26	91	-1.77	102	6.8	-0.1	106	337	86	81
152	23.023	0.148	0.070	2.29	91	-1.89	96	6.8	0	106	336	86	81
153	23.178	0.155	0.065	2.24	91	-1.75	105	6.7	-0.1	106	335	86	82
154	23.328	0.150	0.065	2.26	92	-1.84	101	6.6	-0.1	105	335	86	81
155	23.482	0.154	0.074	2.28	91	-0.67	97	6.5	-0.1	105	334	86	81
156	23.631	0.149	0.073	2.27	91	-1.17	95	6.5	0	105	333	86	81
157	23.784	0.153	0.066	2.26	92	-1.18	102	6.5	0	106	332	85	82
158	23.935	0.151	0.082	2.27	91	-1.6	91	6.4	-0.1	106	331	86	82
159	24.088	0.153	0.076	2.25	92	-1.85	95	6.4	0	105	331	85	82
160	24.241	0.153	0.064	2.27	92	-1.01	104	6.3	-0.1	106	330	85	81
161	24.389	0.148	0.067	2.27	92	-1.86	98	6.2	-0.1	106	331	85	81
162	24.544	0.155	0.067	2.26	91	-0.64	103	6.2	0	106	330	85	81
163	24.693	0.149	0.070	2.24	91	-1.46	97	6.1	-0.1	105	330	85	81
164	24.848	0.155	0.065	2.26	91	-0.85	105	6.1	0	106	331	85	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	24.997	0.149	0.067	2.28	92	-1.82	99	5.9	-0.2	105	330	85	81
166	25.150	0.153	0.067	2.23	92	-0.61	101	6.0	0.1	105	330	85	81
167	25.300	0.150	0.072	2.26	91	-0.74	96	5.9	-0.1	105	331	86	81
168	25.453	0.153	0.064	2.28	91	-0.74	104	5.9	0	105	330	86	81
169	25.606	0.153	0.065	2.28	91	-1.27	103	5.8	-0.1	105	330	86	81
170	25.756	0.150	0.059	2.27	92	-1	106	5.7	-0.1	105	330	86	81
171	25.909	0.153	0.065	2.29	92	-0.74	103	5.7	0	105	330	87	81
172	26.057	0.148	0.066	2.26	92	-1.76	99	5.6	-0.1	105	331	86	81
173	26.213	0.156	0.069	2.25	91	-0.74	102	5.6	0	105	332	86	81
174	26.362	0.149	0.067	2.28	92	-1.62	99	5.5	-0.1	105	332	86	81
175	26.516	0.154	0.076	2.59	91	-0.34	96	5.5	0	105	333	86	81
176	26.667	0.151	0.069	2.30	92	-1.94	99	5.5	0	104	333	86	81
177	26.821	0.154	0.069	2.31	91	-2.04	101	5.3	-0.2	105	332	86	81
178	26.975	0.154	0.069	2.29	91	-0.5	101	5.3	0	106	330	86	81
179	27.126	0.151	0.068	2.29	91	-0.5	100	5.3	0	105	327	86	81
180	27.281	0.155	0.071	2.31	91	-1.75	100	5.2	-0.1	105	322	86	81
181	27.432	0.151	0.077	2.29	91	-1.49	94	5.1	-0.1	105	318	85	81
182	27.588	0.156	0.072	2.29	91	-0.56	100	5.2	0.1	105	314	85	81
183	27.737	0.149	0.070	2.29	91	-0.73	97	5.2	0	104	309	85	81
184	27.891	0.154	0.070	2.31	91	-1.34	100	5.2	0	104	306	85	81
185	28.046	0.155	0.070	2.30	91	-1.61	100	5.1	-0.1	103	303	85	81
186	28.198	0.152	0.067	2.30	91	-0.42	101	5.1	0	103	300	85	81
187	28.352	0.154	0.064	2.27	91	-2	104	5.1	0	103	298	85	82
188	28.502	0.150	0.071	2.28	92	-2.13	96	5.1	0	103	295	85	81
189	28.659	0.157	0.068	2.30	92	-0.66	103	4.9	-0.2	102	292	85	81
190	28.810	0.151	0.065	2.30	91	-1.25	102	5.0	0.1	102	289	86	82
191	28.964	0.154	0.070	2.30	91	-0.47	100	4.9	-0.1	102	287	86	81
192	29.116	0.152	0.064	2.31	91	-1.63	103	5.0	0.1	101	285	86	81
193	29.269	0.153	0.078	2.29	91	-1.41	94	5.0	0	101	284	86	81
194	29.424	0.155	0.067	2.30	91	-1.77	103	4.9	-0.1	101	281	86	81
195	29.574	0.150	0.068	2.32	91	-0.51	98	4.9	0	100	279	86	81
196	29.730	0.156	0.075	2.31	92	-1.85	97	4.9	0	101	277	86	81
197	29.881	0.151	0.065	2.33	91	-0.35	101	4.8	-0.1	100	276	85	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	30.035	0.154	0.073	2.31	92	-2.05	97	4.8	0	99	274	86	81
199	30.187	0.152	0.065	2.31	91	-2.1	102	4.8	0	99	272	86	81
200	30.341	0.154	0.075	2.32	91	-1.66	96	4.8	0	100	271	85	81
201	30.496	0.155	0.072	2.30	91	-0.73	99	4.8	0	100	270	85	81
202	30.646	0.150	0.069	2.30	92	-1.51	97	4.8	0	99	269	85	81
203	30.801	0.155	0.065	2.30	91	-1.9	104	4.8	0	100	267	85	81
204	30.952	0.151	0.072	2.31	92	-1.59	96	4.7	-0.1	100	267	85	81
205	31.108	0.156	0.071	2.30	91	-0.53	100	4.7	0	100	266	85	81
206	31.258	0.150	0.070	2.28	92	-0.36	97	4.6	-0.1	99	264	85	81
207	31.412	0.154	0.065	2.30	92	-1.95	103	4.6	0	99	264	85	81
208	31.566	0.154	0.066	2.31	92	-1.85	102	4.6	0	99	263	86	81
209	31.718	0.152	0.069	2.31	91	-0.94	99	4.6	0	99	263	86	81
210	31.872	0.154	0.067	2.32	92	-0.74	101	4.6	0	98	262	86	81
211	32.022	0.150	0.067	2.29	91	-1.55	99	4.6	0	98	261	86	81
212	32.179	0.157	0.067	2.31	91	-1.44	104	4.6	0	98	260	86	81
213	32.330	0.151	0.068	2.31	91	-1.68	99	4.6	0	98	259	86	80
214	32.483	0.153	0.068	2.33	91	-0.38	100	4.5	-0.1	98	258	86	80
215	32.637	0.154	0.069	2.30	91	-1.21	100	4.5	0	98	259	86	78
216	32.789	0.152	0.066	2.30	91	-0.88	101	4.5	0	97	258	86	79
217	32.944	0.155	0.064	2.30	91	-0.94	105	4.5	0	98	256	86	78
218	33.093	0.149	0.069	2.31	91	-0.41	97	4.4	-0.1	98	256	85	79
219	33.250	0.157	0.067	2.30	91	-1.64	104	4.4	0	98	256	85	80
220	33.401	0.151	0.069	2.32	91	-1.62	98	4.4	0	97	254	85	80
221	33.555	0.154	0.076	2.33	91	-1.87	95	4.4	0	98	255	85	80
222	33.706	0.151	0.070	2.30	91	-1.78	97	4.4	0	97	254	85	80
223	33.861	0.155	0.069	2.29	91	-0.59	101	4.4	0	97	253	85	80
224	34.016	0.155	0.065	2.30	91	-0.55	104	4.3	-0.1	97	253	85	80
225	34.165	0.149	0.068	2.28	91	-0.47	97	4.3	0	97	252	86	80
226	34.321	0.156	0.070	2.29	91	-0.91	101	4.3	0	97	252	86	80
227	34.472	0.151	0.065	2.32	91	-1.82	101	4.3	0	97	252	86	80
228	34.627	0.155	0.070	2.31	91	-2.06	100	4.3	0	97	251	86	80
229	34.778	0.151	0.071	2.30	91	-2.01	97	4.3	0	97	251	86	80
230	34.932	0.154	0.075	2.31	91	-0.75	96	4.2	-0.1	97	250	86	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	35.086	0.154	0.066	2.30	91	-1.78	102	4.2	0	97	251	86	80
232	35.237	0.151	0.066	2.30	91	-1.76	100	4.1	-0.1	96	251	86	80
233	35.392	0.155	0.066	2.31	91	-0.35	103	4.0	-0.1	97	249	86	80
234	35.543	0.151	0.066	2.29	91	-0.74	100	4.2	0.2	97	250	86	80
235	35.699	0.156	0.062	2.30	91	-1.38	107	4.1	-0.1	97	249	85	80
236	35.849	0.150	0.067	2.31	91	-1.01	99	4.1	0	97	250	85	80
237	36.003	0.154	0.066	2.30	91	-1.37	102	4.1	0	97	250	85	80
238	36.157	0.154	0.068	2.30	91	-1.77	101	4.1	0	97	250	85	80
239	36.309	0.152	0.066	2.29	91	-2	101	4.1	0	97	249	85	80
240	36.463	0.154	0.074	2.32	91	-0.67	97	4.0	-0.1	97	250	85	80
241	36.613	0.150	0.065	2.31	91	-0.47	100	4.0	0	97	250	85	80
242	36.770	0.157	0.067	2.31	91	-1.72	103	4.1	0.1	97	250	85	80
243	36.921	0.151	0.068	2.31	91	-2.05	99	4.0	-0.1	96	249	86	80
244	37.074	0.153	0.066	2.28	91	-1.59	102	4.0	0	96	250	86	80
245	37.227	0.153	0.071	2.31	91	-0.83	98	3.9	-0.1	96	250	86	80
246	37.380	0.153	0.071	2.29	91	-0.9	98	3.9	0	96	249	86	81
247	37.535	0.155	0.069	2.30	91	-1.68	101	3.9	0	96	249	86	80
248	37.685	0.150	0.076	2.31	91	-1.64	93	3.9	0	97	249	86	80
249	37.840	0.155	0.072	2.30	91	-1.99	98	3.9	0	96	248	86	80
250	37.991	0.151	0.066	2.30	91	-0.49	100	3.9	0	97	248	86	80
251	38.146	0.155	0.064	2.30	91	-0.49	105	3.8	-0.1	97	249	85	80
252	38.297	0.151	0.070	2.32	91	-1.2	97	3.8	0	97	249	85	80
253	38.451	0.154	0.072	2.31	91	-1.65	98	3.8	0	96	249	85	80
254	38.606	0.155	0.068	2.30	91	-1.75	101	3.8	0	96	249	85	80
255	38.756	0.150	0.068	2.31	91	-0.55	98	3.8	0	96	249	85	81
256	38.911	0.155	0.072	2.31	91	-1.7	98	3.7	-0.1	96	249	85	80
257	39.062	0.151	0.066	2.30	91	-0.51	100	3.7	0	97	249	85	80
258	39.218	0.156	0.070	2.31	91	-1.98	101	3.7	0	96	248	85	80
259	39.368	0.150	0.072	2.32	91	-1.3	95	3.7	0	96	248	85	80
260	39.522	0.154	0.072	2.31	91	-0.29	98	3.7	0	96	248	86	80
261	39.676	0.154	0.073	2.28	91	-1.71	97	3.7	0	96	248	86	80
262	39.828	0.152	0.069	2.31	91	-1.78	99	3.6	-0.1	96	248	86	80
263	39.982	0.154	0.068	2.29	91	-1.27	101	3.6	0	96	248	86	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	40.132	0.150	0.065	2.30	91	-1.61	100	3.6	0	96	248	86	80
265	40.289	0.157	0.069	2.30	91	-1.64	102	3.6	0	96	249	86	80
266	40.440	0.151	0.070	2.31	91	-0.85	97	3.5	-0.1	96	248	86	80
267	40.594	0.154	0.066	2.32	91	-2.14	102	3.5	0	95	247	86	80
268	40.745	0.151	0.071	2.29	91	-0.41	97	3.5	0	95	248	86	80
269	40.899	0.154	0.069	2.30	91	-1.38	100	3.4	-0.1	96	247	85	80
270	41.054	0.155	0.065	2.29	91	-0.72	104	3.5	0.1	96	246	85	80
271	41.203	0.149	0.072	2.31	91	-2.04	95	3.5	0	96	246	85	80
272	41.359	0.156	0.068	2.29	91	-2.12	102	3.5	0	96	246	85	80
273	41.510	0.151	0.069	2.31	91	-1.97	98	3.4	-0.1	96	246	85	80
274	41.665	0.155	0.072	2.31	91	-1.7	98	3.4	0	96	246	85	80
275	41.816	0.151	0.065	2.31	91	-0.89	101	3.4	0	96	245	85	80
276	41.970	0.154	0.069	2.30	91	-2	100	3.4	0	96	246	85	80
277	42.124	0.154	0.066	2.30	91	-2.06	102	3.4	0	96	246	86	81
278	42.274	0.150	0.062	2.31	91	-0.79	103	3.4	0	96	246	86	80
279	42.429	0.155	0.068	2.30	91	-1.97	101	3.4	0	95	245	86	80
280	42.580	0.151	0.075	2.30	91	-2.09	94	3.1	-0.3	96	245	86	80
281	42.736	0.156	0.065	2.31	91	-0.36	104	3.3	0.2	95	244	86	80
282	42.886	0.150	0.069	2.31	91	-1.64	97	3.3	0	95	244	86	80
283	43.040	0.154	0.069	2.31	91	-1.08	100	3.3	0	96	244	86	80
284	43.194	0.154	0.072	2.30	91	-1.21	98	3.3	0	96	243	86	80
285	43.346	0.152	0.071	2.27	91	-2.07	97	3.3	0	95	243	85	80
286	43.500	0.154	0.068	2.30	91	-0.36	101	3.3	0	96	242	85	80
287	43.650	0.150	0.066	2.30	91	-2.01	100	3.2	-0.1	96	242	85	80
288	43.807	0.157	0.070	2.32	91	-0.54	101	3.1	-0.1	96	243	85	80
289	43.958	0.151	0.066	2.32	91	-2.05	100	3.2	0.1	96	242	85	80
290	44.111	0.153	0.069	2.30	91	-0.54	99	3.1	-0.1	95	243	85	79
291	44.263	0.152	0.074	2.30	91	-1.64	95	3.1	0	95	242	85	80
292	44.417	0.154	0.074	2.31	91	-0.5	96	3.1	0	95	243	85	80
293	44.572	0.155	0.069	2.29	91	-1	100	3.1	0	95	242	85	80
294	44.721	0.149	0.074	2.29	91	-2.12	93	3.1	0	95	243	86	80
295	44.877	0.156	0.069	2.30	91	-1.84	101	2.9	-0.2	95	242	86	80
296	45.028	0.151	0.068	2.29	91	-2.13	99	3.1	0.2	95	242	86	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	45.183	0.155	0.068	2.30	91	-1.46	101	3.1	0	95	242	86	80
298	45.334	0.151	0.071	2.31	91	-1.89	97	3.1	0	95	242	86	80
299	45.487	0.153	0.069	2.30	91	-0.48	99	2.9	-0.2	95	241	86	80
300	45.641	0.154	0.066	2.28	91	-0.67	102	3.0	0.1	95	241	86	80
301	45.792	0.151	0.067	2.29	91	-1.95	99	3.0	0	95	241	85	80
302	45.947	0.155	0.076	2.30	91	-0.79	96	3.0	0	95	240	85	80
303	46.098	0.151	0.068	2.29	91	-1.41	99	3.0	0	96	241	85	80
304	46.254	0.156	0.069	2.27	91	-0.45	101	2.8	-0.2	95	241	85	80
305	46.404	0.150	0.072	2.30	91	-1.57	95	2.9	0.1	95	241	85	80
306	46.558	0.154	0.070	2.31	91	-2.06	99	2.9	0	95	241	85	80
307	46.711	0.153	0.066	2.31	91	-0.59	101	2.9	0	95	240	85	80
308	46.864	0.153	0.067	2.31	91	-1.32	101	2.9	0	95	240	85	80
309	47.018	0.154	0.064	2.31	91	-0.46	104	2.9	0	95	240	85	80
310	47.168	0.150	0.077	2.30	91	-1.47	92	2.9	0	95	240	86	80
311	47.324	0.156	0.068	2.29	91	-1.36	102	2.8	-0.1	95	239	86	80
312	47.475	0.151	0.069	2.30	91	-0.45	98	2.8	0	95	239	86	80
313	47.629	0.154	0.063	2.31	91	-0.47	104	2.8	0	95	239	86	80
314	47.781	0.152	0.068	2.29	91	-0.37	99	2.7	-0.1	95	238	86	80
315	47.935	0.154	0.066	2.29	91	-0.63	102	2.8	0.1	95	238	86	80
316	48.089	0.154	0.064	2.28	91	-1.67	104	2.8	0	95	238	85	80
317	48.239	0.150	0.072	2.29	91	-0.43	95	2.8	0	95	238	85	80
318	48.394	0.155	0.077	2.30	91	-2.05	95	2.7	-0.1	95	238	85	80
319	48.545	0.151	0.062	2.29	91	-1.55	103	2.7	0	95	239	85	80
320	48.701	0.156	0.070	2.30	91	-1.57	100	2.7	0	94	239	85	80
321	48.851	0.150	0.064	2.31	91	-2.02	101	2.7	0	94	237	85	80
322	49.005	0.154	0.069	2.31	91	-1.7	100	2.7	0	95	238	85	80
323	49.159	0.154	0.065	2.30	91	-1.09	103	2.7	0	95	237	85	80
324	49.310	0.151	0.070	2.30	91	-1.99	97	2.6	-0.1	95	236	85	80
325	49.465	0.155	0.067	2.32	91	-0.97	102	2.6	0	95	237	86	80
326	49.615	0.150	0.066	2.30	91	-0.64	99	2.5	-0.1	95	237	86	80
327	49.771	0.156	0.068	2.29	91	-1.77	102	2.6	0.1	95	236	86	80
328	49.921	0.150	0.065	2.31	91	-0.72	100	2.6	0	95	236	86	80
329	50.075	0.154	0.073	2.29	91	-1.41	97	2.6	0	95	236	86	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	50.228	0.153	0.064	2.29	91	-1.74	103	2.6	0	95	236	86	80
331	50.381	0.153	0.072	2.31	91	-2.03	97	2.5	-0.1	95	236	85	80
332	50.535	0.154	0.079	2.31	91	-2.07	93	2.5	0	95	236	85	80
333	50.685	0.150	0.070	2.32	91	-0.45	97	2.4	-0.1	95	235	85	80
334	50.841	0.156	0.072	2.29	91	-1.81	99	2.5	0.1	94	235	85	80
335	50.992	0.151	0.075	2.30	91	-0.61	94	2.5	0	94	235	85	80
336	51.146	0.154	0.067	2.31	91	-1.74	101	2.5	0	94	234	85	80
337	51.297	0.151	0.068	2.30	91	-1.19	99	2.5	0	95	233	85	80
338	51.451	0.154	0.068	2.29	91	-0.66	101	2.4	-0.1	95	233	85	80
339	51.606	0.155	0.070	2.29	91	-2.09	100	2.5	0.1	95	233	86	80
340	51.755	0.149	0.070	2.30	91	-0.85	96	2.4	-0.1	95	233	86	80
341	51.911	0.156	0.071	2.31	91	-0.58	100	2.4	0	95	232	86	80
342	52.062	0.151	0.077	2.29	90	-0.78	93	2.4	0	95	232	86	80
343	52.218	0.156	0.064	2.31	91	-0.5	105	2.4	0	95	232	86	80
344	52.367	0.149	0.068	2.29	91	-0.5	97	2.4	0	95	232	86	80
345	52.521	0.154	0.064	2.29	91	-0.63	104	2.3	-0.1	95	232	86	80
346	52.676	0.155	0.064	2.31	90	-1.33	105	2.3	0	95	231	86	80
347	52.828	0.152	0.066	2.30	90	-1.49	101	2.3	0	94	230	85	80
348	52.982	0.154	0.068	2.31	91	-0.79	100	2.3	0	94	230	85	80
349	53.131	0.149	0.075	2.30	90	-1.78	93	2.3	0	94	230	85	80
350	53.288	0.157	0.067	2.29	90	-1.23	103	2.3	0	94	230	85	80
351	53.439	0.151	0.065	2.30	91	-1.12	101	2.3	0	95	230	85	80
352	53.593	0.154	0.069	2.31	90	-0.96	100	2.3	0	94	229	85	80
353	53.745	0.152	0.065	2.30	91	-1.61	101	2.2	-0.1	94	229	85	80
354	53.898	0.153	0.065	2.29	91	-0.54	102	2.1	-0.1	95	229	85	80
355	54.052	0.154	0.070	2.31	90	-1.44	99	2.2	0.1	94	230	86	80
356	54.202	0.150	0.065	2.31	91	-0.63	100	2.2	0	94	229	86	80
357	54.358	0.156	0.066	2.30	91	-0.51	103	2.2	0	94	228	86	80
358	54.508	0.150	0.073	2.31	91	-2.11	94	2.2	0	94	228	86	80
359	54.663	0.155	0.068	2.31	90	-0.59	101	2.1	-0.1	94	228	86	80
360	54.814	0.151	0.069	2.31	91	-1	98	2.1	0	94	228	85	80
361	54.968	0.154	0.070	2.29	90	-0.48	99	2.1	0	94	228	85	80
362	55.123	0.155	0.070	2.31	91	-1.62	100	2.1	0	93	228	85	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	2	Technician:	ADK/SJB
		Date:	4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363	55.273	0.150	0.067	2.31	90	-0.89	99	2.1	0	93	228	85	80
364	55.428	0.155	0.070	2.31	90	-0.48	100	2.1	0	94	227	85	79
365	55.579	0.151	0.067	2.29	90	-0.57	99	2.1	0	94	228	85	80
366	55.734	0.155	0.070	2.28	90	-0.89	100	2.0	-0.1	94	227	85	80
367	55.884	0.150	0.063	2.30	90	-1.66	102	2.0	0	94	227	85	80
368	56.038	0.154	0.066	2.32	91	-2.06	102	2.0	0	94	227	85	80
369	56.192	0.154	0.067	2.29	90	-1.84	101	2.0	0	94	227	86	80
370	56.344	0.152	0.064	2.28	90	-2.08	102	2.0	0	94	227	86	80
371	56.498	0.154	0.063	2.31	90	-1.48	105	2.0	0	94	227	86	80
372	56.648	0.150	0.069	2.31	90	-2.02	97	2.0	0	94	226	86	80
373	56.805	0.157	0.064	2.29	90	-0.6	106	1.9	-0.1	94	226	86	80
374	56.955	0.150	0.066	2.29	90	-1.21	100	1.9	0	94	227	85	80
375	57.109	0.154	0.066	2.29	90	-0.55	102	1.8	-0.1	94	227	85	80
376	57.260	0.151	0.069	2.29	90	-0.4	98	1.9	0.1	93	227	85	80
377	57.414	0.154	0.068	2.30	90	-0.79	101	2.0	0.1	93	226	85	80
378	57.569	0.155	0.069	2.30	90	-2.08	100	1.9	-0.1	93	226	85	80
379	57.718	0.149	0.070	2.29	90	-0.87	96	1.9	0	94	226	85	80
380	57.873	0.155	0.066	2.29	90	-2.1	103	1.8	-0.1	94	226	85	80
381	58.025	0.152	0.067	2.29	91	-1.03	100	1.8	0	94	225	85	80
382	58.180	0.155	0.063	2.29	90	-1.19	105	1.8	0	94	225	85	80
383	58.330	0.150	0.068	2.28	91	-1.75	98	1.8	0	93	225	86	79
384	58.484	0.154	0.072	2.29	90	-1.69	98	1.8	0	94	225	86	80
385	58.638	0.154	0.072	2.32	90	-1.08	98	1.8	0	94	225	86	79
386	58.789	0.151	0.073	2.30	90	-1.97	95	1.8	0	94	224	85	79
387	58.944	0.155	0.068	2.28	90	-2.01	101	1.7	-0.1	93	225	85	79
388	59.093	0.149	0.065	2.30	90	-0.39	100	1.7	0	93	225	86	79
389	59.250	0.157	0.068	2.28	90	-1.62	103	1.7	0	93	225	85	80
390	59.400	0.150	0.074	2.29	90	-0.97	94	1.7	0	93	224	85	80
391	59.554	0.154	0.068	2.32	90	-1.15	101	1.7	0	93	224	85	79
392	59.706	0.152	0.063	2.29	90	-0.59	103	1.7	0	94	224	85	79
393	59.859	0.153	0.069	2.29	90	-0.72	99	1.6	-0.1	93	224	85	80
394	60.014	0.155	0.071	2.31	90	-1	99	1.7	0.1	93	224	85	80
395	60.163	0.149	0.066	2.31	91	-0.7	99	1.6	-0.1	94	224	85	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2
Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396	60.319	0.156	0.069	2.28	90	-1.31	101	1.6	0	94	224	86	80
397	60.470	0.151	0.071	2.30	90	-2.11	97	1.6	0	93	224	85	79
398	60.625	0.155	0.071	2.29	90	-2.16	99	1.6	0	93	224	86	79
399	60.775	0.150	0.070	2.31	90	-1.4	97	1.5	-0.1	93	224	86	79
400	60.929	0.154	0.067	2.29	90	-2.14	101	1.6	0.1	93	223	86	79
401	61.083	0.154	0.066	2.32	90	-2.13	102	1.6	0	93	223	85	80
402	61.234	0.151	0.074	2.29	90	-1.61	95	1.4	-0.2	93	222	85	79
403	61.388	0.154	0.069	2.31	90	-2.05	100	1.5	0.1	93	222	85	79
404	61.539	0.151	0.067	2.28	90	-0.9	99	1.5	0	94	222	85	79
405	61.696	0.157	0.070	2.30	90	-0.42	101	1.5	0	93	222	85	79
406	61.846	0.150	0.074	2.30	90	-0.5	94	1.5	0	93	220	85	80
407	62.000	0.154	0.070	2.30	90	-1.86	99	1.5	0	94	221	85	80
408	62.153	0.153	0.073	2.31	90	-0.56	97	1.5	0	94	221	85	80
409	62.305	0.152	0.068	2.28	90	-1.79	99	1.5	0	93	220	85	79
410	62.459	0.154	0.067	2.32	90	-0.63	101	1.5	0	93	220	86	80
411	62.609	0.150	0.067	2.30	90	-0.49	99	1.4	-0.1	93	220	86	80
412	62.765	0.156	0.065	2.28	90	-2.11	104	1.4	0	93	219	86	79
413	62.915	0.150	0.062	2.29	90	-2.09	103	1.4	0	93	220	86	79
414	63.070	0.155	0.065	2.30	90	-1.98	104	1.4	0	93	219	86	80
415	63.221	0.151	0.066	2.30	90	-0.56	100	1.3	-0.1	92	219	86	79
416	63.375	0.154	0.066	2.30	90	-2.05	102	1.4	0.1	93	218	85	79
417	63.529	0.154	0.065	2.30	90	-0.46	103	1.4	0	93	218	85	80
418	63.679	0.150	0.062	2.28	90	-0.87	103	1.3	-0.1	93	217	85	80
419	63.834	0.155	0.072	2.29	90	-0.47	98	1.3	0	93	217	85	80
420	63.985	0.151	0.073	2.28	90	-1.99	95	1.3	0	93	218	85	80
421	64.141	0.156	0.071	2.29	90	-0.46	100	1.3	0	93	217	85	80
422	64.290	0.149	0.072	2.30	90	-0.53	95	1.3	0	93	216	85	80
423	64.444	0.154	0.066	2.30	90	-0.53	102	1.2	-0.1	92	217	85	80
424	64.598	0.154	0.066	2.29	90	-0.66	102	1.3	0.1	92	217	86	79
425	64.750	0.152	0.065	2.28	90	-0.36	102	1.4	0.1	93	216	85	79
426	64.904	0.154	0.068	2.30	90	-1.87	100	1.2	-0.2	92	216	86	79
427	65.054	0.150	0.067	2.29	90	-0.71	99	1.2	0	93	215	86	79
428	65.210	0.156	0.067	2.29	90	-1.43	103	1.2	0	93	215	86	79

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
429	65.361	0.151	0.071	2.29	90	-1.8	97	1.2	0	93	215	85	79
430	65.515	0.154	0.070	2.32	90	-2.2	99	1.2	0	93	214	85	79
431	65.666	0.151	0.066	2.30	90	-2.06	100	1.2	0	93	214	85	80
432	65.820	0.154	0.074	2.29	90	-2.08	96	1.2	0	93	215	85	79
433	65.974	0.154	0.070	2.30	90	-0.57	99	1.2	0	93	215	85	79
434	66.124	0.150	0.069	2.30	90	-1.27	97	1.2	0	92	215	85	79
435	66.279	0.155	0.066	2.31	90	-2.06	103	1.2	0	93	215	85	79
436	66.430	0.151	0.070	2.27	90	-0.55	97	1.1	-0.1	93	214	85	79
437	66.586	0.156	0.071	2.27	89	-0.89	100	1.1	0	92	214	85	79
438	66.735	0.149	0.068	2.31	90	-0.75	97	1.1	0	92	214	85	79
439	66.889	0.154	0.076	2.31	90	-0.68	95	1.1	0	92	213	85	79
440	67.043	0.154	0.065	2.29	90	-1.7	103	1.0	-0.1	93	214	86	79
441	67.195	0.152	0.071	2.28	90	-0.41	97	1.1	0.1	92	213	86	80
442	67.349	0.154	0.074	2.27	90	-2.05	96	1.1	0	93	214	86	80
443	67.499	0.150	0.074	2.30	90	-2.1	94	1.0	-0.1	93	213	86	79
444	67.655	0.156	0.069	2.27	89	-0.54	101	1.0	0	93	214	86	79
445	67.806	0.151	0.067	2.28	90	-1.78	99	1.0	0	92	214	85	79
446	67.959	0.153	0.067	2.30	90	-0.65	101	1.0	0	93	214	85	79
447	68.111	0.152	0.067	2.30	90	-0.6	100	1.0	0	92	214	85	79
448	68.264	0.153	0.066	2.28	90	-0.8	101	1.0	0	92	214	85	79
449	68.419	0.155	0.068	2.28	89	-0.44	101	1.0	0	92	213	85	79
450	68.568	0.149	0.069	2.31	90	-2	97	1.0	0	92	212	85	79
451	68.723	0.155	0.073	2.30	90	-0.83	98	1.0	0	93	213	85	79
452	68.874	0.151	0.069	2.29	90	-1.52	98	0.9	-0.1	93	213	85	79
453	69.030	0.156	0.071	2.26	90	-1.71	100	0.9	0	93	213	85	80
454	69.180	0.150	0.069	2.30	91	-1.13	97	0.9	0	92	212	85	79
455	69.333	0.153	0.067	2.28	90	-0.71	101	0.9	0	93	213	85	79
456	69.487	0.154	0.069	2.30	90	-0.46	100	0.9	0	93	213	85	79
457	69.639	0.152	0.068	2.29	90	-2.09	99	0.9	0	92	213	86	79
458	69.793	0.154	0.067	2.30	91	-1.84	101	0.9	0	93	213	86	79
459	69.942	0.149	0.068	2.28	90	-1.39	97	0.7	-0.2	92	213	85	79
460	70.099	0.157	0.065	2.29	90	-1.02	105	0.8	0.1	92	213	85	79
461	70.250	0.151	0.076	2.30	90	-2.08	93	0.8	0	92	213	85	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
462	70.403	0.153	0.070	2.30	90	-1.4	98	0.8	0	92	213	85	79
463	70.554	0.151	0.068	2.29	90	-2.03	99	0.8	0	93	212	85	79
464	70.708	0.154	0.067	2.29	90	-0.39	101	0.8	0	93	212	85	79
465	70.863	0.155	0.070	2.29	90	-1.4	100	0.8	0	92	212	85	79
466	71.012	0.149	0.068	2.29	90	-0.61	97	0.8	0	93	212	85	79
467	71.167	0.155	0.067	2.30	90	-0.86	102	0.9	0.1	92	211	85	79
468	71.319	0.152	0.063	2.30	90	-0.68	103	0.7	-0.2	93	212	85	79
469	71.474	0.155	0.062	2.31	90	-0.99	106	0.7	0	92	212	86	80
470	71.624	0.150	0.063	2.28	89	-0.41	102	0.7	0	92	212	85	79
471	71.778	0.154	0.064	2.28	90	-1.42	104	0.7	0	92	212	85	79
472	71.932	0.154	0.067	2.29	90	-1.13	101	0.7	0	92	212	85	79
473	72.084	0.152	0.069	2.29	90	-2.01	98	0.7	0	92	212	85	78
474	72.238	0.154	0.065	2.27	90	-1.01	103	0.7	0	92	211	85	79
475	72.387	0.149	0.067	2.29	90	-2.11	98	0.7	0	92	211	85	79
476	72.544	0.157	0.067	2.28	90	-2.04	103	0.6	-0.1	92	211	85	79
477	72.694	0.150	0.065	2.30	90	-0.72	100	0.6	0	93	212	85	79
478	72.847	0.153	0.073	2.26	90	-1.4	96	0.6	0	92	211	86	79
479	72.999	0.152	0.075	2.31	90	-0.99	94	0.6	0	92	212	86	79
480	73.153	0.154	0.066	2.28	90	-2.03	102	0.6	0	92	211	85	79
481	73.308	0.155	0.068	2.30	90	-1.79	101	0.6	0	92	212	85	79
482	73.457	0.149	0.067	2.27	90	-1.61	98	0.6	0	92	212	85	79
483	73.612	0.155	0.073	2.30	90	-1.35	98	0.6	0	92	210	86	79
484	73.763	0.151	0.064	2.29	90	-1.93	102	0.6	0	92	212	85	79
485	73.918	0.155	0.069	2.30	90	-1.46	100	0.5	-0.1	92	211	85	79
486	74.068	0.150	0.068	2.28	90	-2.13	98	0.6	0.1	92	211	85	79
487	74.221	0.153	0.064	2.29	90	-0.54	103	0.5	-0.1	92	211	85	79
488	74.376	0.155	0.067	2.29	90	-1.3	102	0.5	0	92	211	85	79
489	74.527	0.151	0.073	2.30	90	-0.47	95	0.5	0	92	211	85	79
490	74.681	0.154	0.073	2.30	90	-0.43	97	0.5	0	92	211	85	79
491	74.830	0.149	0.062	2.31	90	-0.37	102	0.5	0	92	211	85	79
492	74.987	0.157	0.067	2.27	90	-0.49	103	0.4	-0.1	92	211	86	79
493	75.138	0.151	0.068	2.29	90	-1.45	99	0.4	0	92	210	85	79
494	75.291	0.153	0.078	2.29	90	-2.12	93	0.4	0	92	210	86	79

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
495	75.442	0.151	0.071	2.29	90	-0.67	96	0.4	0	92	210	86	79
496	75.596	0.154	0.071	2.30	90	-0.71	98	0.3	-0.1	92	210	86	79
497	75.751	0.155	0.067	2.28	90	-2.01	102	0.4	0.1	92	211	85	79
498	75.900	0.149	0.070	2.32	90	-1.78	96	0.3	-0.1	92	211	85	79
499	76.055	0.155	0.071	2.29	90	-0.93	99	0.4	0.1	92	210	86	79
500	76.205	0.150	0.066	2.29	90	-0.8	99	0.4	0	93	211	85	79
501	76.361	0.156	0.068	2.29	90	-1.87	102	0.3	-0.1	92	211	85	79
502	76.510	0.149	0.061	2.27	90	-0.86	103	0.3	0	92	212	85	79
503	76.663	0.153	0.064	2.31	90	-1.63	103	0.3	0	92	211	85	79
504	76.816	0.153	0.068	2.29	90	-1.54	100	0.3	0	92	212	85	79
505	76.968	0.152	0.065	2.29	90	-2.06	101	0.3	0	92	212	85	79
506	77.122	0.154	0.068	2.28	90	-1.98	100	0.2	-0.1	92	212	85	79
507	77.271	0.149	0.070	2.29	90	-2.06	96	0.3	0.1	93	212	85	79
508	77.426	0.155	0.069	2.29	90	-2.1	100	0.3	0	92	212	86	79
509	77.576	0.150	0.070	2.29	90	-1.64	96	0.2	-0.1	92	212	86	79
510	77.731	0.155	0.069	2.28	90	-2.2	100	0.2	0	92	212	86	79
511	77.881	0.150	0.068	2.28	90	-0.54	98	0.2	0	92	212	86	79
512	78.034	0.153	0.068	2.30	90	-0.56	100	0.2	0	92	212	85	79
513	78.187	0.153	0.075	2.28	90	-1.46	95	0.2	0	92	211	85	79
514	78.339	0.152	0.073	2.30	90	-0.42	96	0.2	0	93	211	85	79
515	78.492	0.153	0.074	2.30	90	-0.42	96	0.3	0.1	92	211	85	79
516	78.641	0.149	0.071	2.30	90	-2.06	95	0.2	-0.1	92	211	85	79
517	78.798	0.157	0.066	2.28	90	-2.02	104	0.1	-0.1	92	211	85	79
518	78.947	0.149	0.067	2.29	90	-0.86	98	0.1	0	93	211	85	79
519	79.102	0.155	0.073	2.29	90	-0.61	98	0.1	0	92	211	85	79
520	79.252	0.150	0.074	2.28	90	-0.89	94	0.1	0	92	211	85	79
521	79.406	0.154	0.068	2.30	90	-2.09	100	0.1	0	92	211	85	79
522	79.559	0.153	0.072	2.30	90	-0.69	97	0.1	0	91	212	86	79
523	79.710	0.151	0.066	2.29	90	-2.04	100	0.1	0	92	211	86	79
524	79.864	0.154	0.074	2.29	90	-1.94	96	0.1	0	93	211	86	79
525	80.013	0.149	0.066	2.29	90	-1.79	99	0.0	-0.1	92	211	86	79
Avg/Tot	80.013	0.152	0.069	2.29	90	-1.25	100			103	303	86	80.5

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	83	-1		87	0.000	4.06	0.33
1	0.130	0.130	2.22	83	-2.38	94	86	-0.060	2.61	0.29
2	0.277	0.147	2.21	83	-1.71	101	86	-0.090	5.39	0.64
3	0.419	0.142	2.19	83	-1.47	106	86	-0.100	9.52	0.43
4	0.566	0.147	2.25	83	-1.01	108	85	-0.100	11.20	0.71
5	0.710	0.144	2.22	84	-1.98	109	86	-0.090	11.59	1.04
6	0.857	0.147	2.18	84	-0.73	107	87	-0.080	11.43	1.11
7	1.001	0.144	2.28	84	-2.67	104	87	-0.080	10.06	0.36
8	1.150	0.149	2.26	84	-1.13	105	88	-0.090	9.74	0.20
9	1.293	0.143	2.23	84	-3.21	102	88	-0.080	9.55	0.23
10	1.441	0.148	2.22	85	-2.09	106	87	-0.090	9.58	0.19
11	1.583	0.142	2.20	85	-1.92	102	87	-0.080	9.69	0.21
12	1.730	0.147	2.17	85	-1.59	97	86	-0.090	9.86	0.23
13	1.871	0.141	2.17	85	-1	104	87	-0.090	11.02	0.90
14	2.018	0.147	2.22	86	-2.5	104	86	-0.080	10.64	1.27
15	2.162	0.144	2.29	86	-2.48	106	86	-0.080	10.04	1.33
16	2.311	0.149	2.22	86	-3.47	108	87	-0.080	9.65	0.89
17	2.454	0.143	2.23	87	-3.82	103	87	-0.070	9.39	0.68
18	2.607	0.153	3.34	87	-0.3	109	87	-0.070	9.29	0.50
19	2.757	0.150	2.24	87	-2.82	108	86	-0.080	9.03	0.41
20	2.906	0.149	2.23	88	-2.52	105	86	-0.090	8.76	0.38
21	3.049	0.143	2.22	88	-1.19	99	86	-0.080	8.85	0.32
22	3.198	0.149	2.23	88	-2.97	107	87	-0.090	8.82	0.29
23	3.341	0.143	2.22	89	-2.83	102	88	-0.080	9.00	0.24
24	3.490	0.149	2.22	89	-0.71	103	87	-0.080	8.88	0.23
25	3.633	0.143	2.22	90	-2.16	99	87	-0.090	8.62	0.26
26	3.782	0.149	2.22	90	-0.42	104	86	-0.070	8.58	0.30
27	3.925	0.143	2.21	90	-3.09	103	86	-0.080	8.61	0.27
28	4.074	0.149	2.22	91	-1.07	108	86	-0.080	8.44	0.30
29	4.218	0.144	2.20	91	-0.6	103	87	-0.080	8.45	0.28
30	4.367	0.149	2.21	91	-2.71	111	88	-0.090	8.38	0.29
31	4.510	0.143	2.31	92	-3.08	102	88	-0.090	8.38	0.32

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.663	0.153	2.32	92	-0.53	106	88	-0.080	8.46	0.33
33	4.809	0.146	2.31	92	-1.53	100	87	-0.080	8.67	0.28
34	4.961	0.152	2.31	93	-1.14	109	86	-0.080	8.62	0.31
35	5.108	0.147	2.30	93	-0.72	103	86	-0.080	8.55	0.29
36	5.258	0.150	2.27	93	-0.66	104	85	-0.080	8.61	0.29
37	5.404	0.146	2.26	94	-2.43	100	87	-0.070	8.74	0.30
38	5.554	0.150	2.27	94	-2.46	106	87	-0.080	8.80	0.30
39	5.701	0.147	2.27	94	-0.57	99	87	-0.080	8.89	0.30
40	5.850	0.149	2.25	95	-0.84	104	87	-0.080	8.75	0.35
41	5.998	0.148	2.25	95	-2.86	104	87	-0.070	8.87	0.35
42	6.147	0.149	2.27	95	-0.55	102	86	-0.070	8.81	0.34
43	6.295	0.148	2.26	96	-1.41	103	86	-0.080	8.84	0.34
44	6.445	0.150	2.27	96	-0.56	105	86	-0.080	8.70	0.31
45	6.593	0.148	2.26	96	-0.77	101	87	-0.070	8.58	0.33
46	6.742	0.149	2.26	96	-2.1	103	88	-0.080	8.67	0.31
47	6.891	0.149	2.25	97	-0.69	101	87	-0.070	8.57	0.26
48	7.039	0.148	2.26	97	-1.84	104	87	-0.070	8.44	0.27
49	7.188	0.149	2.26	97	-3.03	102	86	-0.070	8.36	0.30
50	7.335	0.147	2.25	97	-2.32	102	86	-0.080	8.49	0.25
51	7.485	0.150	2.26	98	-0.74	104	86	-0.080	8.32	0.26
52	7.632	0.147	2.24	98	-0.68	105	86	-0.080	8.35	0.27
53	7.782	0.150	2.25	98	-2.16	107	87	-0.080	8.21	0.25
54	7.928	0.146	2.24	98	-0.92	99	87	-0.070	8.26	0.28
55	8.080	0.152	2.25	99	-3.1	103	87	-0.080	8.25	0.28
56	8.226	0.146	2.24	99	-0.63	101	86	-0.080	7.99	0.25
57	8.377	0.151	2.25	99	-1.22	102	86	-0.070	7.84	0.23
58	8.523	0.146	2.25	99	-2.32	103	86	-0.070	7.84	0.19
59	8.675	0.152	2.23	100	-1.38	112	86	-0.070	7.87	0.19
60	8.821	0.146	2.24	100	-2.83	102	87	-0.080	7.89	0.18
61	8.972	0.151	2.25	100	-1.72	101	88	-0.070	7.78	0.19
62	9.118	0.146	2.24	100	-3.03	100	87	-0.070	7.62	0.21
63	9.269	0.151	2.25	100	-0.63	104	87	-0.070	7.77	0.20

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.416	0.147	2.25	101	-1.88	104	86	-0.060	7.68	0.23
65	9.566	0.150	2.24	101	-3.07	101	86	-0.070	7.52	0.23
66	9.714	0.148	2.24	101	-0.99	102	85	-0.070	7.52	0.20
67	9.864	0.150	2.25	101	-2.82	102	85	-0.090	7.26	0.21
68	10.013	0.149	2.25	102	-0.61	103	86	-0.060	7.48	0.22
69	10.162	0.149	2.25	101	-1.73	100	87	-0.070	7.42	0.21
70	10.311	0.149	2.22	102	-1.24	104	87	-0.080	7.27	0.25
71	10.460	0.149	2.24	102	-2.92	97	86	-0.080	7.33	0.22
72	10.609	0.149	2.24	102	-0.67	100	87	-0.080	7.38	0.23
73	10.756	0.147	2.23	102	-3.02	103	86	-0.070	7.28	0.23
74	10.907	0.151	2.24	103	-1.75	103	85	-0.070	7.34	0.25
75	11.053	0.146	2.24	102	-0.89	103	86	-0.070	7.31	0.22
76	11.205	0.152	2.23	103	-1.96	104	87	-0.070	7.33	0.25
77	11.352	0.147	2.25	103	-0.71	104	87	-0.060	7.39	0.23
78	11.503	0.151	2.25	103	-2.45	105	87	-0.070	7.34	0.21
79	11.650	0.147	2.24	103	-2.18	96	87	-0.070	7.58	0.18
80	11.801	0.151	2.25	103	-2.47	97	86	-0.070	7.53	0.21
81	11.948	0.147	2.25	103	-1.39	102	86	-0.070	7.51	0.21
82	12.099	0.151	2.24	103	-2.42	103	85	-0.070	7.55	0.21
83	12.245	0.146	2.23	103	-1.56	99	87	-0.080	7.76	0.20
84	12.396	0.151	2.22	104	-0.57	100	88	-0.070	7.70	0.18
85	12.543	0.147	2.24	104	-2.25	102	87	-0.070	7.82	0.17
86	12.693	0.150	2.23	104	-2.52	103	87	-0.080	7.84	0.15
87	12.841	0.148	2.23	104	-1.07	103	86	-0.070	7.83	0.18
88	12.991	0.150	2.23	104	-2.09	107	86	-0.070	7.87	0.14
89	13.139	0.148	2.22	104	-1.93	103	86	-0.070	7.84	0.16
90	13.288	0.149	2.21	104	-0.99	101	86	-0.080	7.93	0.17
91	13.437	0.149	2.22	105	-2.31	95	87	-0.080	7.68	0.20
92	13.585	0.148	2.21	105	-1.26	101	88	-0.080	7.76	0.18
93	13.734	0.149	2.23	105	-3.02	99	87	-0.070	7.88	0.16
94	13.881	0.147	2.21	105	-2.85	103	87	-0.050	7.89	0.18
95	14.030	0.149	2.21	105	-2.8	103	86	-0.070	7.89	0.15

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2
Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	14.177	0.147	2.20	105	-2.92	100	86	-0.060	8.09	0.14
97	14.328	0.151	2.25	105	-0.85	105	86	-0.070	8.16	0.14
98	14.475	0.147	2.24	105	-3.05	100	87	-0.090	8.05	0.14
99	14.627	0.152	2.23	105	-1.15	104	87	-0.070	8.07	0.14
100	14.775	0.148	2.24	105	-0.91	101	87	-0.080	8.20	0.14
101	14.927	0.152	2.24	105	-0.78	106	86	-0.070	8.08	0.16
102	15.073	0.146	2.23	105	-0.58	98	86	-0.080	8.03	0.19
103	15.226	0.153	2.26	105	-2.64	103	86	-0.070	7.96	0.16
104	15.372	0.146	2.24	105	-1.16	106	86	-0.070	7.68	0.17
105	15.523	0.151	2.23	105	-0.75	111	87	-0.060	7.18	0.15
106	15.670	0.147	2.24	106	-3.23	101	87	-0.060	6.93	0.17
107	15.821	0.151	2.23	106	-1.66	103	87	-0.070	6.90	0.17
108	15.969	0.148	2.23	106	-0.78	103	86	-0.080	6.82	0.18
109	16.120	0.151	2.23	106	-3.16	103	86	-0.050	6.63	0.22
110	16.269	0.149	2.23	106	-2.91	100	86	-0.060	6.71	0.17
111	16.418	0.149	2.23	106	-2.21	100	85	-0.060	6.71	0.21
112	16.569	0.151	2.23	106	-2.63	103	86	-0.070	6.59	0.19
113	16.716	0.147	2.23	106	-3.12	98	87	-0.070	6.49	0.24
114	16.866	0.150	2.23	106	-3.14	102	87	-0.070	6.49	0.25
115	17.014	0.148	2.22	106	-0.77	99	87	-0.070	6.58	0.21
116	17.165	0.151	2.23	106	-2.81	106	86	-0.070	6.40	0.24
117	17.312	0.147	2.24	106	-3.27	100	86	-0.070	6.49	0.23
118	17.464	0.152	2.22	107	-1.32	97	85	-0.060	6.47	0.24
119	17.611	0.147	2.23	106	-2.21	101	86	-0.070	6.56	0.22
120	17.763	0.152	2.22	107	-0.87	109	87	-0.070	6.53	0.25
121	17.910	0.147	2.23	107	-3.07	99	87	-0.070	6.49	0.24
122	18.061	0.151	2.23	107	-0.79	102	87	-0.070	6.41	0.22
123	18.208	0.147	2.23	107	-1.8	102	87	-0.050	5.87	0.27
124	18.359	0.151	2.23	107	-0.87	98	86	-0.060	5.90	0.27
125	18.506	0.147	2.23	107	-1.07	100	86	-0.070	5.75	0.29
126	18.657	0.151	2.24	107	-3.32	104	86	-0.060	5.86	0.27
127	18.806	0.149	2.23	107	-2.9	95	86	-0.060	5.71	0.31

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	18.956	0.150	2.22	107	-3.09	101	87	-0.060	5.59	0.32
129	19.105	0.149	2.22	107	-0.78	100	87	-0.070	5.72	0.31
130	19.254	0.149	2.21	107	-1.53	99	87	-0.070	5.48	0.37
131	19.405	0.151	2.24	107	-1.66	101	86	-0.060	5.49	0.38
132	19.552	0.147	2.24	107	-0.79	97	86	-0.060	5.62	0.36
133	19.703	0.151	2.23	107	-2.37	101	85	-0.070	5.40	0.43
134	19.850	0.147	2.24	107	-1.67	100	86	-0.050	5.56	0.39
135	20.002	0.152	2.23	107	-1.73	102	88	-0.070	5.36	0.48
136	20.150	0.148	2.24	107	-1.18	100	87	-0.070	5.39	0.43
137	20.302	0.152	2.23	107	-0.96	101	87	-0.060	5.41	0.46
138	20.448	0.146	2.22	107	-3.2	101	86	-0.060	5.49	0.43
139	20.601	0.153	2.22	107	-2.27	100	86	-0.070	5.43	0.46
140	20.747	0.146	2.22	107	-0.74	100	85	-0.060	5.47	0.44
141	20.898	0.151	2.23	107	-2.33	104	86	-0.060	5.48	0.46
142	21.046	0.148	2.23	107	-2.98	98	87	-0.050	5.39	0.47
143	21.196	0.150	2.22	107	-1.51	102	87	-0.050	5.34	0.48
144	21.344	0.148	2.23	107	-0.74	101	87	-0.060	5.34	0.46
145	21.495	0.151	2.23	107	-0.74	104	86	-0.050	5.34	0.44
146	21.644	0.149	2.21	107	-2.82	100	86	-0.060	5.36	0.48
147	21.793	0.149	2.21	107	-2.92	98	86	-0.070	5.26	0.47
148	21.943	0.150	2.20	107	-2.97	97	86	-0.060	5.35	0.47
149	22.092	0.149	2.21	108	-1.28	101	87	-0.050	5.31	0.46
150	22.241	0.149	2.22	107	-1.24	100	87	-0.060	5.29	0.49
151	22.388	0.147	2.20	107	-0.95	99	87	-0.060	5.29	0.47
152	22.539	0.151	2.21	107	-2.63	100	86	-0.050	5.40	0.46
153	22.686	0.147	2.20	107	-1.2	101	86	-0.060	5.57	0.43
154	22.837	0.151	2.22	107	-1.18	104	86	-0.080	5.45	0.46
155	22.984	0.147	2.20	108	-0.91	95	86	-0.060	5.51	0.40
156	23.135	0.151	2.19	107	-1.49	98	88	-0.050	5.39	0.47
157	23.281	0.146	2.20	108	-1.14	100	87	-0.070	5.46	0.44
158	23.432	0.151	2.20	107	-0.69	93	87	-0.060	5.51	0.42
159	23.578	0.146	2.18	108	-2.31	93	86	-0.060	5.40	0.44

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	23.730	0.152	2.20	108	-0.72	105	86	-0.060	5.43	0.43
161	23.875	0.145	2.19	108	-1.09	98	86	-0.060	5.38	0.45
162	24.025	0.150	2.20	107	-0.89	102	85	-0.060	5.47	0.41
163	24.171	0.146	2.19	107	-2.2	97	87	-0.060	5.42	0.44
164	24.321	0.150	2.19	108	-2.27	103	88	-0.060	5.52	0.41
165	24.468	0.147	2.19	108	-1.16	99	87	-0.060	5.58	0.40
166	24.617	0.149	2.18	108	-2.51	101	86	-0.060	5.46	0.43
167	24.764	0.147	2.18	108	-0.94	96	86	-0.070	5.46	0.40
168	24.913	0.149	2.18	108	-1.46	103	85	-0.070	5.43	0.43
169	25.060	0.147	2.19	108	-0.87	101	85	-0.060	5.55	0.42
170	25.210	0.150	2.18	108	-1.77	108	86	-0.050	5.51	0.45
171	25.357	0.147	2.18	108	-0.76	101	87	-0.060	5.71	0.40
172	25.505	0.148	2.17	108	-0.86	101	87	-0.060	5.57	0.43
173	25.653	0.148	2.17	108	-0.94	99	87	-0.050	5.71	0.38
174	25.800	0.147	2.17	108	-0.88	99	87	-0.050	5.66	0.36
175	25.948	0.148	2.19	108	-3.07	94	86	-0.050	5.66	0.34
176	26.099	0.151	2.25	108	-2.4	101	86	-0.060	5.69	0.37
177	26.249	0.150	2.26	108	-1.4	100	86	-0.060	5.57	0.36
178	26.398	0.149	2.26	108	-3.33	99	87	-0.060	5.49	0.36
179	26.550	0.152	2.25	108	-1.29	102	87	-0.050	5.40	0.28
180	26.698	0.148	2.26	108	-3.33	97	87	-0.040	4.82	0.30
181	26.851	0.153	2.26	108	-0.94	97	87	-0.060	4.35	0.41
182	26.999	0.148	2.24	108	-3.35	97	86	-0.050	4.11	0.42
183	27.152	0.153	2.26	108	-0.84	101	86	-0.050	4.00	0.49
184	27.299	0.147	2.25	108	-2.99	97	86	-0.060	3.72	0.64
185	27.452	0.153	2.27	108	-1.9	101	87	-0.050	3.59	0.75
186	27.601	0.149	2.25	108	-1.15	101	87	-0.060	3.55	0.74
187	27.753	0.152	2.25	108	-3.27	105	87	-0.070	3.62	0.73
188	27.903	0.150	2.26	108	-0.82	98	87	-0.060	3.61	0.71
189	28.053	0.150	2.27	108	-3.24	100	86	-0.050	3.61	0.73
190	28.204	0.151	2.26	108	-0.97	103	86	-0.050	3.62	0.74
191	28.353	0.149	2.25	108	-0.75	98	85	-0.050	3.64	0.71

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	28.505	0.152	2.25	108	-0.93	105	86	-0.050	3.76	0.68
193	28.654	0.149	2.26	108	-0.91	93	87	-0.040	3.73	0.63
194	28.807	0.153	2.26	108	-3.4	103	87	-0.050	3.86	0.59
195	28.955	0.148	2.24	108	-0.89	99	87	-0.050	3.80	0.59
196	29.108	0.153	2.26	108	-3.37	98	86	-0.040	3.82	0.59
197	29.255	0.147	2.26	108	-3.21	101	86	-0.050	3.90	0.60
198	29.407	0.152	2.27	108	-0.71	98	86	-0.050	3.81	0.65
199	29.557	0.150	2.26	108	-3.05	102	86	-0.040	3.79	0.63
200	29.709	0.152	2.27	108	-1.86	97	87	-0.050	3.88	0.65
201	29.859	0.150	2.26	108	-1.6	97	87	-0.040	3.84	0.65
202	30.009	0.150	2.25	108	-2.91	99	87	-0.050	3.89	0.67
203	30.160	0.151	2.27	108	-0.85	103	86	-0.040	3.85	0.71
204	30.309	0.149	2.27	108	-1.26	97	86	-0.040	3.85	0.73
205	30.461	0.152	2.24	108	-0.94	99	86	-0.040	4.03	0.68
206	30.610	0.149	2.25	108	-1.93	98	86	-0.050	4.03	0.71
207	30.763	0.153	2.26	108	-1.11	105	87	-0.040	3.96	0.71
208	30.911	0.148	2.28	108	-1.99	100	87	-0.050	3.89	0.73
209	31.063	0.152	2.26	108	-3.15	101	87	-0.040	4.03	0.74
210	31.212	0.149	2.26	108	-1.27	100	86	-0.050	3.97	0.74
211	31.363	0.151	2.26	108	-3.31	102	86	-0.050	4.01	0.76
212	31.513	0.150	2.26	108	-1.19	101	85	-0.060	3.81	0.82
213	31.665	0.152	2.25	108	-1.95	101	86	-0.050	3.90	0.78
214	31.816	0.151	2.25	108	-1.64	101	87	-0.050	3.94	0.78
215	31.965	0.149	2.27	108	-1.57	99	87	-0.070	3.99	0.79
216	32.116	0.151	2.26	108	-1.02	102	87	-0.030	3.86	0.79
217	32.265	0.149	2.26	108	-1.03	103	86	-0.050	3.92	0.80
218	32.418	0.153	2.26	108	-1.49	101	86	-0.050	3.84	0.85
219	32.566	0.148	2.26	108	-0.88	100	85	-0.050	3.89	0.82
220	32.719	0.153	2.26	108	-3.12	101	86	-0.040	3.96	0.77
221	32.868	0.149	2.27	108	-0.88	94	87	-0.050	3.80	0.72
222	33.019	0.151	2.26	108	-2.53	99	87	-0.040	3.85	0.73
223	33.168	0.149	2.27	108	-3.33	99	87	-0.050	3.83	0.72

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	33.320	0.152	2.26	108	-3.02	104	86	-0.040	3.80	0.70
225	33.470	0.150	2.26	108	-2.75	100	85	-0.040	3.86	0.67
226	33.621	0.151	2.27	108	-0.76	99	86	-0.040	3.79	0.70
227	33.772	0.151	2.27	108	-1.69	103	87	-0.040	3.88	0.68
228	33.921	0.149	2.26	108	-3.08	98	87	-0.050	3.84	0.68
229	34.073	0.152	2.28	108	-3.36	99	87	-0.050	3.97	0.62
230	34.221	0.148	2.25	108	-1.44	94	86	-0.040	3.97	0.64
231	34.374	0.153	2.26	108	-3.37	104	86	-0.050	4.05	0.63
232	34.522	0.148	2.26	108	-2.97	100	85	-0.040	3.99	0.69
233	34.675	0.153	2.26	108	-3.27	104	86	-0.040	3.98	0.71
234	34.823	0.148	2.27	108	-0.89	100	87	-0.050	4.02	0.73
235	34.975	0.152	2.24	108	-2.58	106	87	-0.040	3.96	0.72
236	35.123	0.148	2.25	108	-1.68	99	87	-0.060	4.06	0.68
237	35.275	0.152	2.24	108	-0.89	103	86	-0.050	3.95	0.69
238	35.425	0.150	2.25	108	-0.89	100	85	-0.040	4.09	0.70
239	35.576	0.151	2.23	108	-2.13	102	85	-0.050	4.09	0.66
240	35.727	0.151	2.27	108	-2.11	97	86	-0.060	4.10	0.67
241	35.875	0.148	2.28	108	-2.99	101	87	-0.050	4.14	0.67
242	36.027	0.152	2.26	108	-3.32	102	87	-0.040	4.20	0.67
243	36.175	0.148	2.26	108	-3.26	99	86	-0.050	4.02	0.68
244	36.328	0.153	2.27	108	-2.7	103	86	-0.060	4.10	0.64
245	36.476	0.148	2.26	108	-2.64	97	85	-0.070	3.92	0.67
246	36.629	0.153	2.26	108	-3.07	100	86	-0.050	4.01	0.62
247	36.777	0.148	2.26	108	-0.85	98	87	-0.030	3.98	0.65
248	36.928	0.151	2.25	108	-3.38	95	87	-0.040	3.98	0.64
249	37.077	0.149	2.26	108	-2.01	96	87	-0.050	4.00	0.62
250	37.228	0.151	2.25	107	-1.01	102	86	-0.040	3.97	0.65
251	37.378	0.150	2.26	108	-1.59	103	85	-0.060	4.06	0.62
252	37.529	0.151	2.26	108	-0.84	99	86	-0.060	3.98	0.66
253	37.679	0.150	2.26	107	-3.19	97	87	-0.020	4.04	0.63
254	37.829	0.150	2.26	108	-0.92	100	87	-0.050	3.92	0.64
255	37.979	0.150	2.26	108	-1.06	100	87	-0.050	4.08	0.63

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	38.128	0.149	2.26	108	-1.17	96	86	-0.040	4.15	0.64
257	38.279	0.151	2.25	107	-0.89	102	85	-0.040	4.14	0.65
258	38.428	0.149	2.25	108	-1.99	98	85	-0.050	3.91	0.68
259	38.581	0.153	2.25	108	-3.38	99	86	-0.050	3.92	0.66
260	38.728	0.147	2.25	107	-2.81	95	87	-0.050	3.96	0.65
261	38.881	0.153	2.25	108	-1	98	87	-0.030	3.93	0.69
262	39.028	0.147	2.25	108	-0.97	97	86	-0.040	3.93	0.70
263	39.180	0.152	2.25	108	-3.39	101	86	-0.050	3.94	0.69
264	39.328	0.148	2.27	108	-1.39	101	85	-0.050	3.88	0.67
265	39.480	0.152	2.24	108	-2.94	101	86	-0.040	3.89	0.68
266	39.630	0.150	2.25	107	-0.93	99	87	-0.050	3.86	0.69
267	39.780	0.150	2.24	108	-3.13	101	87	-0.040	3.90	0.66
268	39.930	0.150	2.26	108	-1.13	98	87	-0.050	3.81	0.68
269	40.078	0.148	2.25	108	-1.13	98	86	-0.040	3.85	0.62
270	40.229	0.151	2.24	107	-3.29	103	85	-0.050	3.73	0.66
271	40.377	0.148	2.24	107	-1.66	96	85	-0.050	3.76	0.61
272	40.529	0.152	2.23	107	-2.2	101	87	-0.030	3.62	0.62
273	40.677	0.148	2.24	107	-3.36	98	87	-0.050	3.68	0.61
274	40.829	0.152	2.24	107	-2.68	99	87	-0.060	3.60	0.62
275	40.977	0.148	2.24	107	-0.98	101	86	-0.050	3.57	0.61
276	41.129	0.152	2.24	107	-2.29	101	86	-0.040	3.75	0.58
277	41.276	0.147	2.24	107	-2.25	100	85	-0.030	3.70	0.57
278	41.428	0.152	2.26	107	-3.44	106	86	-0.040	3.81	0.54
279	41.576	0.148	2.25	108	-0.92	99	87	-0.050	3.86	0.55
280	41.727	0.151	2.23	107	-0.89	96	87	-0.050	3.69	0.59
281	41.876	0.149	2.23	108	-3.36	101	87	-0.050	3.69	0.56
282	42.027	0.151	2.25	107	-1.09	100	86	-0.040	3.58	0.58
283	42.177	0.150	2.23	108	-3.22	99	85	-0.050	3.79	0.56
284	42.326	0.149	2.23	107	-1.46	97	86	-0.050	3.75	0.59
285	42.476	0.150	2.25	107	-0.98	98	86	-0.050	3.71	0.59
286	42.624	0.148	2.24	107	-3.25	99	87	-0.050	3.61	0.63
287	42.775	0.151	2.24	107	-2.12	102	87	-0.040	3.72	0.58

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	42.924	0.149	2.24	107	-1.85	98	86	-0.040	3.64	0.58
289	43.076	0.152	2.24	107	-3.37	103	85	-0.050	3.67	0.58
290	43.223	0.147	2.23	107	-1.53	97	85	-0.040	3.75	0.54
291	43.376	0.153	2.24	107	-2.22	98	86	-0.050	3.81	0.55
292	43.522	0.146	2.24	107	-1.49	93	87	-0.040	3.62	0.55
293	43.673	0.151	2.23	107	-3.37	100	87	-0.040	3.79	0.52
294	43.821	0.148	2.22	107	-0.95	95	87	-0.050	3.83	0.51
295	43.972	0.151	2.25	107	-0.79	100	86	-0.040	3.73	0.54
296	44.121	0.149	2.23	107	-1.46	99	85	-0.050	3.73	0.52
297	44.272	0.151	2.23	107	-3.42	101	85	-0.050	3.75	0.54
298	44.421	0.149	2.23	107	-3.34	97	87	-0.060	3.81	0.51
299	44.571	0.150	2.23	107	-0.96	99	87	-0.040	3.67	0.50
300	44.721	0.150	2.23	107	-1.18	102	87	-0.050	3.83	0.52
301	44.869	0.148	2.23	107	-3.07	99	86	-0.050	3.81	0.54
302	45.020	0.151	2.23	107	-1.66	95	86	-0.040	3.87	0.49
303	45.167	0.147	2.22	107	-1.99	98	85	-0.040	3.76	0.53
304	45.319	0.152	2.23	107	-1.11	101	85	-0.040	3.88	0.50
305	45.466	0.147	2.23	107	-1.36	95	87	-0.050	3.73	0.56
306	45.619	0.153	2.23	107	-2.58	101	87	-0.060	3.62	0.54
307	45.765	0.146	2.23	107	-2.79	99	87	-0.040	3.88	0.50
308	45.918	0.153	2.24	107	-1.47	103	86	-0.040	3.79	0.53
309	46.064	0.146	2.24	107	-2.13	100	85	-0.040	3.57	0.58
310	46.215	0.151	2.23	107	-1.04	95	86	-0.040	3.67	0.61
311	46.363	0.148	2.23	107	-2	99	87	-0.040	3.67	0.57
312	46.513	0.150	2.23	107	-0.92	99	87	-0.050	3.66	0.55
313	46.662	0.149	2.21	107	-0.93	103	87	-0.040	3.61	0.56
314	46.813	0.151	2.22	107	-0.87	101	86	-0.040	3.76	0.53
315	46.962	0.149	2.23	107	-0.99	101	86	-0.040	3.60	0.58
316	47.111	0.149	2.23	107	-1.75	102	85	-0.060	3.57	0.54
317	47.262	0.151	2.25	107	-1.7	98	86	-0.040	3.61	0.55
318	47.409	0.147	2.22	107	-1.8	92	87	-0.040	3.68	0.54
319	47.560	0.151	2.22	107	-1.03	105	87	-0.040	3.47	0.59

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	47.707	0.147	2.22	107	-0.95	97	87	-0.040	3.46	0.57
321	47.858	0.151	2.23	107	-1.45	104	86	-0.040	3.44	0.57
322	48.006	0.148	2.23	107	-1.3	98	85	-0.040	3.53	0.54
323	48.158	0.152	2.22	107	-1	104	85	-0.050	3.44	0.52
324	48.305	0.147	2.24	107	-2.96	97	86	-0.050	3.45	0.54
325	48.457	0.152	2.23	107	-3.01	102	87	-0.060	3.54	0.52
326	48.604	0.147	2.23	107	-2.53	100	87	-0.040	3.52	0.54
327	48.755	0.151	2.23	107	-2	101	86	-0.040	3.55	0.53
328	48.901	0.146	2.22	107	-1.02	100	86	-0.030	3.42	0.53
329	49.053	0.152	2.23	107	-1.27	98	85	-0.040	3.39	0.53
330	49.200	0.147	2.23	107	-2.87	101	86	-0.040	3.38	0.52
331	49.351	0.151	2.22	107	-2.21	98	87	-0.050	3.44	0.56
332	49.500	0.149	2.22	107	-1.68	92	87	-0.040	3.52	0.51
333	49.650	0.150	2.22	107	-3.38	99	87	-0.050	3.50	0.51
334	49.799	0.149	2.22	107	-1.18	96	86	-0.040	3.42	0.52
335	49.948	0.149	2.24	107	-3.05	95	85	-0.040	3.48	0.50
336	50.098	0.150	2.23	107	-3.37	101	85	-0.040	3.63	0.49
337	50.245	0.147	2.22	107	-1.71	98	86	-0.040	3.57	0.52
338	50.397	0.152	2.23	107	-1.14	101	87	-0.040	3.50	0.49
339	50.543	0.146	2.23	107	-2.1	96	87	-0.040	3.39	0.52
340	50.695	0.152	2.22	107	-1	100	86	-0.040	3.35	0.54
341	50.843	0.148	2.22	107	-3.07	97	86	-0.040	3.49	0.49
342	50.995	0.152	2.24	107	-2.68	95	85	-0.050	3.30	0.50
343	51.141	0.146	2.22	107	-2.25	100	86	-0.030	3.45	0.51
344	51.293	0.152	2.22	107	-3.01	101	87	-0.060	3.35	0.51
345	51.440	0.147	2.24	107	-1.7	101	87	-0.050	3.48	0.50
346	51.591	0.151	2.24	107	-3.35	104	87	-0.040	3.40	0.54
347	51.738	0.147	2.23	107	-2.68	99	86	-0.050	3.43	0.50
348	51.888	0.150	2.23	107	-1.36	100	85	-0.040	3.54	0.49
349	52.036	0.148	2.23	107	-1.65	94	85	-0.030	3.50	0.50
350	52.187	0.151	2.22	107	-1.1	101	86	-0.040	3.44	0.52
351	52.336	0.149	2.23	107	-3.45	102	87	-0.050	3.59	0.50

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	52.485	0.149	2.23	107	-3.02	99	87	-0.040	3.42	0.51
353	52.635	0.150	2.22	107	-1.57	102	86	-0.060	3.41	0.51
354	52.784	0.149	2.24	107	-1.94	102	85	-0.040	3.50	0.47
355	52.933	0.149	2.22	107	-1.14	98	85	-0.030	3.42	0.51
356	53.081	0.148	2.22	107	-1.04	101	86	-0.040	3.33	0.50
357	53.232	0.151	2.22	107	-2.46	102	87	-0.040	3.31	0.52
358	53.378	0.146	2.24	107	-1.01	94	87	-0.040	3.47	0.51
359	53.530	0.152	2.23	107	-0.94	101	87	-0.030	3.50	0.50
360	53.677	0.147	2.22	107	-2.97	97	86	-0.040	3.45	0.50
361	53.829	0.152	2.21	107	-3.55	100	85	-0.040	3.36	0.53
362	53.976	0.147	2.22	107	-0.99	96	85	-0.040	3.50	0.50
363	54.128	0.152	2.21	107	-2.11	102	86	-0.040	3.39	0.53
364	54.274	0.146	2.22	107	-2.27	96	87	-0.050	3.41	0.52
365	54.425	0.151	2.21	107	-3.36	101	87	-0.040	3.38	0.50
366	54.572	0.147	2.20	107	-3.08	97	86	-0.040	3.48	0.50
367	54.722	0.150	2.21	107	-3.22	104	86	-0.040	3.43	0.51
368	54.869	0.147	2.22	107	-1.12	99	85	-0.040	3.51	0.51
369	55.020	0.151	2.22	107	-1.59	101	86	-0.040	3.39	0.50
370	55.169	0.149	2.21	107	-1.74	102	87	-0.040	3.47	0.51
371	55.318	0.149	2.24	108	-1.08	103	87	-0.050	3.49	0.51
372	55.468	0.150	2.22	107	-2.53	99	87	-0.050	3.36	0.53
373	55.616	0.148	2.20	107	-2.18	102	86	-0.030	3.48	0.50
374	55.766	0.150	2.22	107	-3.2	101	85	-0.040	3.49	0.50
375	55.913	0.147	2.23	107	-1.94	99	85	-0.030	3.28	0.51
376	56.063	0.150	2.21	107	-1.01	99	86	-0.030	3.47	0.49
377	56.211	0.148	2.22	107	-3.45	99	87	-0.040	3.31	0.51
378	56.361	0.150	2.20	107	-2.13	99	87	-0.050	3.27	0.53
379	56.508	0.147	2.20	107	-3.31	97	86	-0.040	3.27	0.50
380	56.660	0.152	2.22	107	-1.81	103	86	-0.040	3.47	0.48
381	56.807	0.147	2.21	107	-3.3	99	85	-0.050	3.39	0.51
382	56.958	0.151	2.22	107	-3.44	105	85	-0.050	3.32	0.51
383	57.105	0.147	2.21	107	-3.25	98	87	-0.040	3.40	0.48

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
384	57.256	0.151	2.22	107	-2.88	98	87	-0.050	3.38	0.49
385	57.402	0.146	2.22	107	-2	95	87	-0.040	3.40	0.52
386	57.553	0.151	2.22	107	-1.15	97	86	-0.040	3.25	0.54
387	57.700	0.147	2.20	107	-3.38	98	85	-0.040	3.22	0.51
388	57.850	0.150	2.23	107	-1.79	102	86	-0.040	3.38	0.48
389	57.997	0.147	2.22	107	-1.56	98	86	-0.040	3.35	0.50
390	58.147	0.150	2.20	107	-3.11	96	87	-0.040	3.24	0.49
391	58.296	0.149	2.22	107	-1.71	99	87	-0.040	3.35	0.52
392	58.446	0.150	2.22	107	-3.26	104	87	-0.040	3.34	0.47
393	58.594	0.148	2.20	107	-2.91	98	85	-0.040	3.26	0.48
394	58.743	0.149	2.21	107	-1.1	97	85	-0.050	3.27	0.50
395	58.893	0.150	2.23	107	-3.38	101	86	-0.040	3.20	0.50
396	59.040	0.147	2.21	107	-2.98	97	87	-0.050	3.27	0.49
397	59.190	0.150	2.23	107	-3.04	98	87	-0.040	3.12	0.47
398	59.337	0.147	2.21	107	-2.13	96	86	-0.040	3.04	0.45
399	59.488	0.151	2.21	107	-2.18	99	86	-0.040	2.90	0.50
400	59.634	0.146	2.21	107	-1.55	98	85	-0.040	2.95	0.47
401	59.785	0.151	2.21	108	-3.23	102	85	-0.040	3.06	0.50
402	59.932	0.147	2.22	107	-1.47	94	87	-0.050	2.95	0.47
403	60.083	0.151	2.21	107	-1.32	100	87	-0.040	2.99	0.51
404	60.230	0.147	2.21	107	-3.29	99	86	-0.040	2.98	0.49
405	60.381	0.151	2.21	107	-0.97	99	86	-0.040	3.00	0.47
406	60.528	0.147	2.21	107	-1.76	94	85	-0.020	2.95	0.50
407	60.679	0.151	2.22	107	-1.1	99	85	-0.040	3.00	0.49
408	60.825	0.146	2.21	107	-1.81	94	86	-0.040	3.06	0.44
409	60.975	0.150	2.21	107	-2.12	100	87	-0.040	2.93	0.47
410	61.122	0.147	2.22	107	-2.44	99	87	-0.040	3.01	0.44
411	61.272	0.150	2.22	107	-3.34	101	86	-0.050	3.07	0.44
412	61.419	0.147	2.21	107	-3.36	100	86	-0.040	2.90	0.48
413	61.570	0.151	2.21	107	-1.8	105	85	-0.040	2.90	0.48
414	61.718	0.148	2.21	107	-1.54	101	86	-0.030	2.93	0.50
415	61.868	0.150	2.21	107	-2.44	101	87	-0.030	2.93	0.46

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
416	62.016	0.148	2.21	107	-3.15	100	87	-0.050	2.97	0.44
417	62.165	0.149	2.21	107	-2.8	101	86	-0.040	2.99	0.45
418	62.314	0.149	2.21	107	-3.46	104	86	-0.040	2.90	0.45
419	62.462	0.148	2.22	107	-0.98	96	85	-0.040	3.00	0.44
420	62.611	0.149	2.21	107	-1.27	96	85	-0.050	2.98	0.45
421	62.758	0.147	2.20	107	-1.16	96	86	-0.030	2.90	0.48
422	62.908	0.150	2.21	107	-1.19	97	87	-0.040	2.93	0.48
423	63.055	0.147	2.21	107	-2.38	99	87	-0.040	2.96	0.44
424	63.206	0.151	2.21	107	-1.6	102	86	-0.040	2.99	0.46
425	63.353	0.147	2.22	107	-3.31	100	86	-0.040	3.01	0.44
426	63.504	0.151	2.20	107	-1.08	100	85	-0.040	2.92	0.48
427	63.650	0.146	2.21	107	-0.95	98	85	-0.030	3.02	0.46
428	63.801	0.151	2.21	107	-1.95	101	87	-0.040	3.07	0.46
429	63.948	0.147	2.20	107	-2.98	96	87	-0.040	2.95	0.45
430	64.099	0.151	2.21	107	-1.04	99	86	-0.040	2.98	0.45
431	64.245	0.146	2.22	107	-2.92	99	86	-0.040	2.98	0.46
432	64.395	0.150	2.22	107	-1.79	96	85	-0.040	3.06	0.44
433	64.542	0.147	2.22	107	-3.38	96	85	-0.050	2.91	0.47
434	64.692	0.150	2.22	107	-3.08	99	86	-0.040	2.93	0.50
435	64.839	0.147	2.21	107	-3.36	99	87	-0.050	3.00	0.48
436	64.989	0.150	2.22	107	-3.42	98	87	-0.030	3.00	0.49
437	65.138	0.149	2.21	107	-1.17	97	86	-0.040	3.14	0.47
438	65.287	0.149	2.20	107	-3.47	99	85	-0.040	3.07	0.53
439	65.436	0.149	2.21	107	-3.19	94	85	-0.030	3.00	0.51
440	65.584	0.148	2.21	107	-1.98	101	85	-0.040	2.97	0.53
441	65.733	0.149	2.20	107	-2.92	97	86	-0.040	2.98	0.50
442	65.881	0.148	2.20	107	-1.82	94	87	-0.040	3.02	0.49
443	66.031	0.150	2.22	107	-2.19	96	86	-0.040	3.01	0.49
444	66.177	0.146	2.22	107	-3.31	96	86	-0.040	3.13	0.49
445	66.327	0.150	2.20	107	-2.43	100	85	-0.040	3.00	0.51
446	66.474	0.147	2.22	107	-3.38	99	85	-0.040	3.14	0.48
447	66.624	0.150	2.21	107	-3.26	100	86	-0.030	3.06	0.49

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
448	66.771	0.147	2.21	107	-1.06	99	87	-0.050	3.03	0.46
449	66.922	0.151	2.21	107	-2.71	100	87	-0.050	3.05	0.48
450	67.068	0.146	2.20	107	-1.21	96	86	-0.040	3.05	0.48
451	67.220	0.152	2.21	107	-2.06	98	85	-0.040	2.94	0.49
452	67.366	0.146	2.20	107	-1.27	96	85	-0.050	2.96	0.49
453	67.517	0.151	2.20	107	-1.01	98	85	-0.040	2.94	0.51
454	67.664	0.147	2.22	107	-3.41	97	86	-0.040	2.94	0.49
455	67.814	0.150	2.21	107	-0.95	101	87	-0.030	2.99	0.49
456	67.960	0.146	2.22	107	-3.32	96	86	-0.040	3.11	0.46
457	68.110	0.150	2.20	107	-1.56	100	85	-0.040	3.02	0.46
458	68.257	0.147	2.23	107	-1.52	99	85	-0.040	3.09	0.47
459	68.407	0.150	2.22	107	-1.82	100	86	-0.040	3.02	0.46
460	68.554	0.147	2.21	107	-2.31	100	87	-0.030	2.99	0.47
461	68.704	0.150	2.20	107	-2.27	94	87	-0.030	3.05	0.47
462	68.853	0.149	2.21	107	-2.01	98	87	-0.030	2.90	0.50
463	69.002	0.149	2.21	107	-3.17	99	86	-0.030	3.02	0.46
464	69.150	0.148	2.22	107	-2.9	99	85	-0.040	2.95	0.46
465	69.299	0.149	2.22	107	-0.97	98	85	-0.040	3.00	0.47
466	69.448	0.149	2.20	107	-1.07	99	86	-0.040	2.97	0.49
467	69.596	0.148	2.21	107	-3.46	99	87	-0.040	2.87	0.50
468	69.745	0.149	2.21	107	-2.01	103	87	-0.040	2.93	0.50
469	69.892	0.147	2.22	107	-2.82	102	86	-0.040	2.88	0.50
470	70.042	0.150	2.21	107	-0.98	104	86	-0.040	2.99	0.49
471	70.189	0.147	2.20	107	-1.93	101	85	-0.040	2.84	0.49
472	70.339	0.150	2.21	107	-1.91	100	86	-0.040	2.92	0.52
473	70.485	0.146	2.21	107	-1.38	96	87	-0.040	2.97	0.46
474	70.637	0.152	2.20	107	-2.58	103	87	-0.040	2.92	0.45
475	70.783	0.146	2.21	107	-1.59	98	86	-0.050	2.91	0.49
476	70.934	0.151	2.21	107	-2.36	101	85	-0.030	2.82	0.50
477	71.080	0.146	2.21	107	-0.99	99	85	-0.030	3.06	0.49
478	71.231	0.151	2.22	107	-2.87	97	86	-0.040	2.82	0.46
479	71.378	0.147	2.19	107	-1.77	93	87	-0.040	2.95	0.50

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
480	71.528	0.150	2.21	107	-1.1	101	87	-0.040	2.85	0.51
481	71.674	0.146	2.21	107	-3.39	97	87	-0.040	2.86	0.50
482	71.824	0.150	2.22	107	-1.08	100	86	-0.040	2.97	0.47
483	71.971	0.147	2.21	107	-1.18	94	85	-0.040	2.92	0.49
484	72.121	0.150	2.23	107	-3.47	103	86	-0.040	2.80	0.51
485	72.267	0.146	2.21	107	-2.63	96	86	-0.050	2.91	0.48
486	72.417	0.150	2.20	107	-3.34	100	87	-0.040	3.08	0.51
487	72.564	0.147	2.19	107	-1.13	101	87	-0.040	3.07	0.50
488	72.714	0.150	2.20	107	-1.09	100	86	-0.040	3.10	0.48
489	72.862	0.148	2.18	107	-2.94	95	85	-0.040	2.92	0.49
490	73.011	0.149	2.20	107	-1.52	96	85	-0.020	3.08	0.48
491	73.159	0.148	2.20	107	-0.93	103	86	-0.040	2.95	0.50
492	73.308	0.149	2.19	107	-2.44	100	87	-0.030	2.87	0.51
493	73.457	0.149	2.22	107	-1.07	99	87	-0.040	3.11	0.50
494	73.604	0.147	2.21	107	-1.04	91	86	-0.040	2.98	0.48
495	73.753	0.149	2.22	107	-2.24	97	85	-0.050	2.97	0.51
496	73.900	0.147	2.20	107	-1.65	96	85	-0.030	2.95	0.50
497	74.050	0.150	2.21	107	-3.35	100	86	-0.030	3.00	0.52
498	74.196	0.146	2.20	107	-0.95	96	87	-0.050	2.91	0.53
499	74.346	0.150	2.20	107	-1.39	98	87	-0.050	3.06	0.46
500	74.492	0.146	2.21	107	-1.31	99	86	-0.040	3.07	0.48
501	74.643	0.151	2.20	107	-1.13	100	85	-0.030	3.00	0.51
502	74.789	0.146	2.20	107	-3.41	103	85	-0.050	3.02	0.49
503	74.940	0.151	2.20	107	-2.07	104	86	-0.030	3.03	0.47
504	75.086	0.146	2.21	107	-1.4	97	87	-0.020	2.99	0.49
505	75.236	0.150	2.19	107	-2.66	102	87	-0.040	3.10	0.47
506	75.382	0.146	2.20	107	-1.76	97	86	-0.050	2.99	0.48
507	75.533	0.151	2.19	107	-1.83	99	86	-0.020	2.95	0.49
508	75.679	0.146	2.22	107	-3.41	96	85	-0.040	3.01	0.50
509	75.829	0.150	2.20	107	-1.13	98	86	-0.040	3.05	0.47
510	75.974	0.145	2.20	107	-3.17	96	86	-0.020	3.15	0.49
511	76.124	0.150	2.20	107	-3.18	100	87	-0.040	3.04	0.46

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
512	76.270	0.146	2.20	107	-2.43	97	86	-0.030	3.00	0.47
513	76.420	0.150	2.18	107	-3.55	95	86	-0.020	2.96	0.51
514	76.566	0.146	2.19	107	-1.69	94	85	-0.030	3.04	0.45
515	76.716	0.150	2.19	107	-2.26	96	85	-0.030	3.05	0.47
516	76.862	0.146	2.19	107	-1.18	95	86	-0.040	3.01	0.50
517	77.011	0.149	2.18	107	-1.91	101	87	-0.030	2.96	0.49
518	77.158	0.147	2.17	107	-1.97	99	87	-0.030	3.07	0.47
519	77.307	0.149	2.19	107	-1.13	96	86	-0.040	2.95	0.46
520	77.454	0.147	2.18	107	-3.51	94	85	-0.040	2.95	0.46
521	77.603	0.149	2.18	107	-3.42	99	85	-0.030	3.01	0.47
522	77.750	0.147	2.16	107	-3.44	95	86	-0.040	2.85	0.48
523	77.898	0.148	2.18	107	-3.5	100	87	-0.040	2.84	0.48
524	78.046	0.148	2.18	107	-1.11	94	86	-0.040	2.85	0.46
Avg/Tot	78.193	0.149	2.23	105	-1.98	100			4.73	0.47

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	546	529	365	337	386	432.6	N/A
1	540	528	372	331	391	432.4	N/A
2	535	525	377	326	393	431.2	N/A
3	528	520	381	322	395	429.2	N/A
4	521	515	383	322	397	427.6	N/A
5	514	511	384	329	398	427.2	N/A
6	510	508	384	338	401	428.2	N/A
7	506	505	384	349	404	429.6	N/A
8	503	503	383	361	405	431.0	N/A
9	501	500	382	376	406	433.0	N/A
10	498	499	380	388	407	434.4	N/A
11	496	497	378	398	408	435.4	N/A
12	494	495	376	409	408	436.4	N/A
13	493	494	374	421	408	438.0	N/A
14	494	493	372	430	410	439.8	N/A
15	495	493	371	440	411	442.0	N/A
16	495	492	370	448	413	443.6	N/A
17	497	492	369	458	413	445.8	N/A
18	498	491	368	462	414	446.6	N/A
19	499	490	368	468	414	447.8	N/A
20	500	489	367	473	415	448.8	N/A
21	500	488	367	474	414	448.6	N/A
22	501	486	366	477	414	448.8	N/A
23	501	485	366	479	414	449.0	N/A
24	501	483	365	480	413	448.4	N/A
25	500	481	365	482	413	448.2	N/A
26	499	481	364	482	412	447.6	N/A
27	498	479	363	483	411	446.8	N/A
28	498	478	363	483	410	446.4	N/A
29	497	477	363	483	408	445.6	N/A
30	497	476	362	482	407	444.8	N/A
31	496	476	362	483	405	444.4	N/A
32	496	475	361	483	403	443.6	N/A
33	495	474	358	482	399	441.6	N/A
34	495	473	356	480	396	440.0	N/A
35	494	472	354	476	393	437.8	N/A
36	493	472	352	473	390	436.0	N/A
37	493	471	350	467	387	433.6	N/A
38	491	470	348	464	384	431.4	N/A
39	491	469	346	460	381	429.4	N/A
40	491	469	345	456	378	427.8	N/A
41	490	468	343	454	376	426.2	N/A
42	490	467	342	450	373	424.4	N/A
43	490	466	340	448	370	422.8	N/A
44	489	466	339	446	367	421.4	N/A
45	490	465	338	444	365	420.4	N/A
46	489	464	337	442	362	418.8	N/A
47	489	463	336	440	360	417.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	489	462	335	438	357	416.2	N/A
49	489	462	334	435	355	415.0	N/A
50	488	461	334	434	353	414.0	N/A
51	488	460	333	431	350	412.4	N/A
52	488	459	332	431	348	411.6	N/A
53	488	458	332	429	346	410.6	N/A
54	487	457	331	427	344	409.2	N/A
55	486	457	330	425	342	408.0	N/A
56	486	456	330	424	340	407.2	N/A
57	486	455	329	422	338	406.0	N/A
58	485	454	329	421	336	405.0	N/A
59	485	453	329	418	335	404.0	N/A
60	484	452	328	416	333	402.6	N/A
61	483	450	328	413	331	401.0	N/A
62	482	449	328	412	330	400.2	N/A
63	481	448	327	408	328	398.4	N/A
64	480	448	327	408	326	397.8	N/A
65	479	448	326	405	325	396.6	N/A
66	478	446	326	404	323	395.4	N/A
67	477	446	326	401	322	394.4	N/A
68	475	445	325	400	320	393.0	N/A
69	474	445	325	397	319	392.0	N/A
70	473	444	325	395	318	391.0	N/A
71	471	443	324	393	316	389.4	N/A
72	470	443	324	391	315	388.6	N/A
73	469	442	324	388	313	387.2	N/A
74	469	441	323	386	312	386.2	N/A
75	468	441	323	385	310	385.4	N/A
76	467	440	323	384	309	384.6	N/A
77	466	439	323	382	308	383.6	N/A
78	465	439	323	380	307	382.8	N/A
79	464	439	322	378	306	381.8	N/A
80	463	438	322	377	305	381.0	N/A
81	463	438	322	375	304	380.4	N/A
82	462	438	322	374	303	379.8	N/A
83	461	438	322	374	302	379.4	N/A
84	461	438	322	374	301	379.2	N/A
85	461	439	322	372	300	378.8	N/A
86	461	439	323	372	299	378.8	N/A
87	461	439	323	370	298	378.2	N/A
88	461	440	323	370	297	378.2	N/A
89	461	441	324	369	296	378.2	N/A
90	461	442	325	370	296	378.8	N/A
91	462	443	325	370	295	379.0	N/A
92	461	444	326	369	294	378.8	N/A
93	461	444	326	368	294	378.6	N/A
94	462	446	327	370	293	379.6	N/A
95	462	446	328	370	292	379.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2
Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	462	447	329	369	292	379.8	N/A
97	462	448	329	369	292	380.0	N/A
98	463	449	330	369	291	380.4	N/A
99	463	450	331	370	290	380.8	N/A
100	464	451	332	370	290	381.4	N/A
101	464	452	332	370	289	381.4	N/A
102	464	453	333	371	289	382.0	N/A
103	465	454	334	371	289	382.6	N/A
104	465	455	335	373	289	383.4	N/A
105	465	456	336	373	288	383.6	N/A
106	464	456	337	372	288	383.4	N/A
107	464	458	337	371	288	383.6	N/A
108	462	458	337	370	287	382.8	N/A
109	461	459	338	368	287	382.6	N/A
110	460	459	338	367	287	382.2	N/A
111	459	459	339	365	287	381.8	N/A
112	457	459	339	363	287	381.0	N/A
113	456	458	339	360	287	380.0	N/A
114	455	458	340	358	286	379.4	N/A
115	454	458	340	354	286	378.4	N/A
116	452	457	340	353	286	377.6	N/A
117	451	457	340	350	286	376.8	N/A
118	450	457	340	348	286	376.2	N/A
119	449	456	340	346	286	375.4	N/A
120	448	455	340	344	286	374.6	N/A
121	447	455	340	340	286	373.6	N/A
122	446	455	340	340	286	373.4	N/A
123	446	454	340	337	286	372.6	N/A
124	445	454	340	336	286	372.2	N/A
125	444	453	340	333	286	371.2	N/A
126	443	452	340	331	286	370.4	N/A
127	442	452	340	328	287	369.8	N/A
128	441	450	339	325	287	368.4	N/A
129	440	449	339	323	287	367.6	N/A
130	438	449	339	321	287	366.8	N/A
131	437	447	338	318	287	365.4	N/A
132	436	446	338	316	287	364.6	N/A
133	434	445	337	313	287	363.2	N/A
134	433	444	337	310	288	362.4	N/A
135	431	443	336	307	288	361.0	N/A
136	430	441	336	306	288	360.2	N/A
137	429	440	335	304	288	359.2	N/A
138	428	439	335	302	288	358.4	N/A
139	427	437	334	299	289	357.2	N/A
140	426	436	334	296	289	356.2	N/A
141	425	434	333	293	289	354.8	N/A
142	425	433	333	291	290	354.4	N/A
143	424	431	332	290	289	353.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	423	430	332	288	290	352.6	N/A
145	422	429	331	285	290	351.4	N/A
146	422	427	331	283	290	350.6	N/A
147	421	426	331	281	290	349.8	N/A
148	421	425	330	280	290	349.2	N/A
149	420	423	330	278	290	348.2	N/A
150	419	422	330	276	291	347.6	N/A
151	418	421	331	276	291	347.4	N/A
152	418	420	330	273	291	346.4	N/A
153	418	419	330	273	291	346.2	N/A
154	418	418	330	271	292	345.8	N/A
155	418	417	330	270	291	345.2	N/A
156	418	417	330	268	292	345.0	N/A
157	417	416	331	269	292	345.0	N/A
158	418	415	330	268	292	344.6	N/A
159	418	414	330	266	292	344.0	N/A
160	418	414	330	265	293	344.0	N/A
161	418	414	331	265	293	344.2	N/A
162	418	413	331	264	293	343.8	N/A
163	418	413	331	263	293	343.6	N/A
164	419	412	331	262	293	343.4	N/A
165	419	412	331	261	293	343.2	N/A
166	419	411	332	261	293	343.2	N/A
167	420	411	332	261	294	343.6	N/A
168	421	410	332	260	294	343.4	N/A
169	421	411	333	260	295	344.0	N/A
170	422	410	332	260	294	343.6	N/A
171	423	410	333	259	295	344.0	N/A
172	423	410	334	258	295	344.0	N/A
173	424	410	334	259	295	344.4	N/A
174	426	410	334	259	295	344.8	N/A
175	427	410	335	257	295	344.8	N/A
176	428	410	336	258	295	345.4	N/A
177	429	411	336	257	296	345.8	N/A
178	430	412	337	258	296	346.6	N/A
179	429	412	337	258	296	346.4	N/A
180	430	413	338	258	296	347.0	N/A
181	428	413	338	258	296	346.6	N/A
182	428	413	337	257	296	346.2	N/A
183	426	413	337	256	297	345.8	N/A
184	423	411	336	255	297	344.4	N/A
185	421	410	336	253	297	343.4	N/A
186	418	408	335	252	297	342.0	N/A
187	416	407	334	251	298	341.2	N/A
188	413	405	333	248	298	339.4	N/A
189	411	403	332	247	298	338.2	N/A
190	408	401	330	244	298	336.2	N/A
191	406	399	329	243	299	335.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	404	397	328	241	299	333.8	N/A
193	402	395	327	239	300	332.6	N/A
194	400	393	326	238	300	331.4	N/A
195	398	392	324	235	300	329.8	N/A
196	395	390	323	233	300	328.2	N/A
197	394	388	321	232	301	327.2	N/A
198	392	386	320	230	300	325.6	N/A
199	390	385	319	227	300	324.2	N/A
200	389	383	318	227	301	323.6	N/A
201	386	382	317	225	301	322.2	N/A
202	385	380	316	223	301	321.0	N/A
203	384	379	315	222	301	320.2	N/A
204	382	378	314	220	301	319.0	N/A
205	380	377	313	219	301	318.0	N/A
206	379	375	312	217	301	316.8	N/A
207	378	374	311	216	301	316.0	N/A
208	377	373	311	215	301	315.4	N/A
209	376	372	310	213	301	314.4	N/A
210	375	372	309	212	301	313.8	N/A
211	373	370	309	212	301	313.0	N/A
212	372	370	308	210	301	312.2	N/A
213	371	369	308	210	302	312.0	N/A
214	371	368	307	208	302	311.2	N/A
215	369	367	307	207	302	310.4	N/A
216	369	367	306	207	302	310.2	N/A
217	368	366	306	207	302	309.8	N/A
218	368	366	306	206	302	309.6	N/A
219	367	365	305	205	302	308.8	N/A
220	366	365	305	204	302	308.4	N/A
221	366	364	305	204	302	308.2	N/A
222	365	364	304	203	303	307.8	N/A
223	364	363	304	203	303	307.4	N/A
224	364	363	304	202	303	307.2	N/A
225	364	363	303	201	303	306.8	N/A
226	364	363	303	200	303	306.6	N/A
227	363	362	303	200	303	306.2	N/A
228	363	362	303	200	303	306.2	N/A
229	362	362	303	199	304	306.0	N/A
230	362	362	302	199	304	305.8	N/A
231	362	361	302	198	304	305.4	N/A
232	361	361	302	198	304	305.2	N/A
233	360	361	302	198	304	305.0	N/A
234	360	361	302	197	305	305.0	N/A
235	360	361	302	197	305	305.0	N/A
236	360	361	302	197	305	305.0	N/A
237	359	360	302	197	305	304.6	N/A
238	360	361	302	197	305	305.0	N/A
239	359	361	302	196	306	304.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	359	361	302	195	306	304.6	N/A
241	358	360	302	196	306	304.4	N/A
242	358	360	302	196	306	304.4	N/A
243	358	360	302	196	306	304.4	N/A
244	358	360	302	196	306	304.4	N/A
245	358	360	302	195	307	304.4	N/A
246	358	361	302	195	307	304.6	N/A
247	358	361	301	196	307	304.6	N/A
248	358	361	302	195	307	304.6	N/A
249	358	361	301	196	307	304.6	N/A
250	357	361	302	196	308	304.8	N/A
251	358	361	302	195	308	304.8	N/A
252	357	361	302	195	308	304.6	N/A
253	358	361	302	194	308	304.6	N/A
254	357	361	302	194	308	304.4	N/A
255	357	361	302	194	309	304.6	N/A
256	357	361	302	194	308	304.4	N/A
257	357	361	302	194	309	304.6	N/A
258	357	361	301	194	309	304.4	N/A
259	357	361	301	194	309	304.4	N/A
260	357	361	302	194	309	304.6	N/A
261	357	361	301	194	309	304.4	N/A
262	357	361	301	194	309	304.4	N/A
263	356	361	301	194	309	304.2	N/A
264	356	361	302	194	309	304.4	N/A
265	357	361	302	194	310	304.8	N/A
266	356	361	301	193	310	304.2	N/A
267	356	361	302	193	310	304.4	N/A
268	356	361	302	193	310	304.4	N/A
269	356	361	302	194	310	304.6	N/A
270	356	360	302	194	310	304.4	N/A
271	357	360	302	193	310	304.4	N/A
272	356	360	302	193	310	304.2	N/A
273	357	360	302	193	310	304.4	N/A
274	357	359	302	193	311	304.4	N/A
275	357	359	302	192	310	304.0	N/A
276	356	359	302	192	311	304.0	N/A
277	356	358	302	191	311	303.6	N/A
278	356	358	303	191	311	303.8	N/A
279	356	358	302	191	311	303.6	N/A
280	356	358	302	192	311	303.8	N/A
281	355	357	302	191	311	303.2	N/A
282	356	357	302	191	311	303.4	N/A
283	356	357	302	191	312	303.6	N/A
284	355	356	302	191	311	303.0	N/A
285	355	356	302	191	312	303.2	N/A
286	355	356	302	191	312	303.2	N/A
287	355	355	302	191	312	303.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	355	355	301	190	312	302.6	N/A
289	355	355	301	190	312	302.6	N/A
290	355	355	301	190	313	302.8	N/A
291	355	354	301	190	312	302.4	N/A
292	354	354	301	190	313	302.4	N/A
293	355	354	301	190	312	302.4	N/A
294	355	354	300	190	313	302.4	N/A
295	355	353	300	190	313	302.2	N/A
296	354	353	300	189	313	301.8	N/A
297	354	353	300	189	313	301.8	N/A
298	354	353	300	188	313	301.6	N/A
299	354	353	300	189	313	301.8	N/A
300	354	353	299	189	312	301.4	N/A
301	354	352	299	188	312	301.0	N/A
302	354	352	299	188	312	301.0	N/A
303	354	352	299	188	312	301.0	N/A
304	354	352	299	188	312	301.0	N/A
305	353	352	298	188	312	300.6	N/A
306	354	351	298	188	312	300.6	N/A
307	354	351	298	188	312	300.6	N/A
308	353	351	298	188	311	300.2	N/A
309	353	351	298	187	311	300.0	N/A
310	353	350	298	186	311	299.6	N/A
311	353	350	298	187	311	299.8	N/A
312	353	350	298	186	311	299.6	N/A
313	353	350	298	186	311	299.6	N/A
314	353	350	297	186	311	299.4	N/A
315	353	349	297	185	311	299.0	N/A
316	353	349	297	185	311	299.0	N/A
317	352	349	297	186	310	298.8	N/A
318	352	349	297	185	310	298.6	N/A
319	352	349	297	185	310	298.6	N/A
320	352	349	297	185	310	298.6	N/A
321	352	348	296	186	310	298.4	N/A
322	352	348	296	185	309	298.0	N/A
323	352	348	296	185	309	298.0	N/A
324	352	348	296	185	309	298.0	N/A
325	352	348	296	184	309	297.8	N/A
326	351	348	296	184	308	297.4	N/A
327	351	348	296	184	308	297.4	N/A
328	351	348	295	184	308	297.2	N/A
329	351	348	295	183	307	296.8	N/A
330	351	348	295	183	307	296.8	N/A
331	351	348	295	183	307	296.8	N/A
332	351	347	294	183	306	296.2	N/A
333	351	347	294	182	306	296.0	N/A
334	350	347	294	182	306	295.8	N/A
335	350	347	294	182	305	295.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	350	347	293	182	304	295.2	N/A
337	350	347	293	183	304	295.4	N/A
338	350	347	293	182	304	295.2	N/A
339	349	346	293	182	303	294.6	N/A
340	349	346	292	181	303	294.2	N/A
341	348	346	292	182	303	294.2	N/A
342	348	346	292	181	302	293.8	N/A
343	348	346	291	181	302	293.6	N/A
344	348	345	291	180	302	293.2	N/A
345	348	345	291	180	301	293.0	N/A
346	347	345	291	179	301	292.6	N/A
347	347	345	290	179	301	292.4	N/A
348	347	345	290	179	300	292.2	N/A
349	346	345	290	179	300	292.0	N/A
350	346	345	290	179	300	292.0	N/A
351	345	344	290	180	299	291.6	N/A
352	345	344	289	179	299	291.2	N/A
353	345	344	289	179	298	291.0	N/A
354	344	344	289	179	298	290.8	N/A
355	344	343	289	178	298	290.4	N/A
356	343	343	289	178	298	290.2	N/A
357	343	343	289	178	298	290.2	N/A
358	343	343	288	177	297	289.6	N/A
359	343	343	288	177	297	289.6	N/A
360	343	343	288	177	297	289.6	N/A
361	342	343	288	177	297	289.4	N/A
362	342	342	288	177	297	289.2	N/A
363	342	342	288	177	296	289.0	N/A
364	341	342	288	177	296	288.8	N/A
365	341	342	287	177	295	288.4	N/A
366	341	342	287	177	295	288.4	N/A
367	341	342	287	176	295	288.2	N/A
368	340	341	287	176	295	287.8	N/A
369	340	341	287	176	295	287.8	N/A
370	340	341	287	176	294	287.6	N/A
371	340	342	287	176	294	287.8	N/A
372	339	341	287	176	294	287.4	N/A
373	340	341	287	176	293	287.4	N/A
374	339	341	287	175	293	287.0	N/A
375	339	341	287	175	293	287.0	N/A
376	339	341	286	175	292	286.6	N/A
377	339	341	286	175	292	286.6	N/A
378	339	341	286	176	292	286.8	N/A
379	338	340	286	175	291	286.0	N/A
380	338	340	286	175	291	286.0	N/A
381	338	340	286	175	290	285.8	N/A
382	337	339	286	175	290	285.4	N/A
383	337	339	286	175	290	285.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	337	339	286	174	290	285.2	N/A
385	338	339	285	174	289	285.0	N/A
386	337	338	286	174	289	284.8	N/A
387	338	338	285	174	288	284.6	N/A
388	338	338	285	173	288	284.4	N/A
389	337	338	285	174	288	284.4	N/A
390	337	338	285	173	287	284.0	N/A
391	337	337	285	174	287	284.0	N/A
392	336	336	285	173	286	283.2	N/A
393	337	336	285	174	286	283.6	N/A
394	336	336	285	173	286	283.2	N/A
395	336	336	285	173	286	283.2	N/A
396	337	335	285	173	286	283.2	N/A
397	336	335	285	173	285	282.8	N/A
398	336	335	285	173	285	282.8	N/A
399	336	335	286	172	285	282.8	N/A
400	336	334	286	172	284	282.4	N/A
401	336	334	285	172	284	282.2	N/A
402	336	334	285	171	284	282.0	N/A
403	335	333	285	172	283	281.6	N/A
404	335	333	286	172	283	281.8	N/A
405	335	332	285	172	283	281.4	N/A
406	335	332	285	171	282	281.0	N/A
407	335	331	285	171	282	280.8	N/A
408	335	331	284	170	282	280.4	N/A
409	334	330	284	171	282	280.2	N/A
410	334	330	284	170	281	279.8	N/A
411	334	329	283	171	281	279.6	N/A
412	334	329	283	171	281	279.6	N/A
413	334	328	282	169	280	278.6	N/A
414	334	328	282	170	280	278.8	N/A
415	334	327	282	169	280	278.4	N/A
416	334	327	282	170	279	278.4	N/A
417	334	326	281	170	279	278.0	N/A
418	333	326	281	170	278	277.6	N/A
419	333	325	280	169	278	277.0	N/A
420	333	324	280	168	278	276.6	N/A
421	333	324	279	168	277	276.2	N/A
422	333	324	279	169	277	276.4	N/A
423	333	323	279	168	276	275.8	N/A
424	333	322	278	168	276	275.4	N/A
425	332	322	278	167	276	275.0	N/A
426	332	322	277	167	276	274.8	N/A
427	332	321	277	167	275	274.4	N/A
428	332	320	277	167	275	274.2	N/A
429	332	320	276	167	274	273.8	N/A
430	331	320	276	167	274	273.6	N/A
431	331	319	276	167	274	273.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	331	319	275	166	273	272.8	N/A
433	331	319	275	166	273	272.8	N/A
434	331	318	275	165	272	272.2	N/A
435	331	318	275	165	272	272.2	N/A
436	330	318	275	165	272	272.0	N/A
437	330	317	274	166	272	271.8	N/A
438	330	317	274	165	271	271.4	N/A
439	330	317	274	165	271	271.4	N/A
440	330	317	274	165	270	271.2	N/A
441	330	317	273	165	270	271.0	N/A
442	330	316	274	164	270	270.8	N/A
443	330	316	273	164	270	270.6	N/A
444	330	316	273	164	269	270.4	N/A
445	331	315	273	163	269	270.2	N/A
446	330	315	273	163	268	269.8	N/A
447	330	315	272	163	268	269.6	N/A
448	331	315	273	163	267	269.8	N/A
449	331	314	273	163	267	269.6	N/A
450	331	315	272	163	267	269.6	N/A
451	332	315	272	164	267	270.0	N/A
452	332	314	272	164	266	269.6	N/A
453	332	314	272	163	266	269.4	N/A
454	331	314	272	163	265	269.0	N/A
455	332	314	272	163	265	269.2	N/A
456	332	314	272	163	265	269.2	N/A
457	332	313	272	163	265	269.0	N/A
458	333	313	272	162	264	268.8	N/A
459	332	314	272	162	264	268.8	N/A
460	332	313	272	163	263	268.6	N/A
461	332	313	272	162	264	268.6	N/A
462	332	313	272	163	263	268.6	N/A
463	332	313	272	163	263	268.6	N/A
464	332	313	272	163	262	268.4	N/A
465	332	312	272	162	262	268.0	N/A
466	333	312	272	162	262	268.2	N/A
467	332	312	271	162	262	267.8	N/A
468	332	311	271	162	262	267.6	N/A
469	332	312	271	162	261	267.6	N/A
470	332	311	271	162	261	267.4	N/A
471	332	311	271	161	261	267.2	N/A
472	331	311	270	162	261	267.0	N/A
473	331	311	270	162	261	267.0	N/A
474	331	311	270	162	261	267.0	N/A
475	330	311	270	163	261	267.0	N/A
476	330	310	269	161	261	266.2	N/A
477	330	310	269	161	261	266.2	N/A
478	330	310	268	161	261	266.0	N/A
479	329	310	268	162	261	266.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	329	310	268	161	261	265.8	N/A
481	329	309	268	161	261	265.6	N/A
482	328	309	267	161	261	265.2	N/A
483	329	309	267	161	261	265.4	N/A
484	328	309	267	162	261	265.4	N/A
485	328	309	267	162	261	265.4	N/A
486	328	309	267	161	261	265.2	N/A
487	327	309	267	161	261	265.0	N/A
488	327	309	266	161	261	264.8	N/A
489	327	308	266	161	261	264.6	N/A
490	327	309	266	161	262	265.0	N/A
491	327	308	266	161	262	264.8	N/A
492	327	308	266	161	262	264.8	N/A
493	327	308	266	161	262	264.8	N/A
494	328	308	265	161	262	264.8	N/A
495	327	308	265	161	261	264.4	N/A
496	328	308	265	161	262	264.8	N/A
497	328	308	265	160	262	264.6	N/A
498	328	308	265	161	262	264.8	N/A
499	328	308	265	161	262	264.8	N/A
500	328	307	265	160	262	264.4	N/A
501	328	307	265	161	262	264.6	N/A
502	328	307	265	161	262	264.6	N/A
503	328	307	265	161	262	264.6	N/A
504	328	307	265	161	262	264.6	N/A
505	327	307	265	161	262	264.4	N/A
506	327	307	265	161	262	264.4	N/A
507	328	307	265	160	262	264.4	N/A
508	328	307	265	161	262	264.6	N/A
509	327	307	265	160	262	264.2	N/A
510	328	307	265	160	262	264.4	N/A
511	327	306	265	160	262	264.0	N/A
512	327	306	265	160	262	264.0	N/A
513	327	307	265	161	262	264.4	N/A
514	327	306	265	161	261	264.0	N/A
515	327	306	266	161	261	264.2	N/A
516	326	306	266	162	261	264.2	N/A
517	326	306	266	161	261	264.0	N/A
518	326	306	267	161	261	264.2	N/A
519	327	306	267	160	261	264.2	N/A
520	326	306	267	161	261	264.2	N/A
521	326	306	267	161	261	264.2	N/A
522	325	306	268	161	260	264.0	N/A
523	325	306	268	161	260	264.0	N/A
524	325	306	268	161	260	264.0	N/A
Average	388	380	307	246	302	325	N/A

LAB SAMPLE DATA - ASTM E2515

Client: FPI
Model: I2450
Run #: 2

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/9/2019

TRAIN A (1st Hour)

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights: Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T136	178.1	87.6	3.0
B. Rear filter catch	Filter	T137		87.5	
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total	Total Particulate, mg:	3.0

TRAIN A (Post 1st hour)

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights: Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T143	175.0	86.5	1.2
B. Rear filter catch	Filter	T138		87.3	
C. Probe catch*	Probe	15A	117418.1	117417.9	0.2
D. O-Ring catch*	O-Ring	15A	3567.0	3565.5	1.5

Sub-Total	Total Particulate, mg:	2.9
Train A Aggregate	Total Particulate, mg:	**5.9**

TRAIN B

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights: Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T139/T141	262.0	173.7	3.4
B. Rear filter catch	Filter	T140		84.9	
C. Probe catch*	Probe	15B	116905.4	116905.3	0.1
D. O-Ring catch*	O-Ring	15B	3567.6	3566.1	1.5

Total Particulate, mg:	**5.0**

AMBIENT

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights: Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	T142	87.0	86.9	0.1

Total Particulate, mg:	**0.1**

*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight.

ASTM E3053 Wood Heater Run Sheets

Client: FPI Job Number: 19-469 Tracking #: 0025
Model: I2450 Run Number: 2 Test Date: 4/9/2019

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 08:20
Air Control Setting: Fully Open

Time	Notes
0:00	Started PB with 1.8 lb, torch for 25 sec
2:30	Closed door (1.2 lb)
8:00	Loaded 2.3 lb of kindling & startup (@ 0.5 lb)
20:00	Loaded remaining 2.5 lb of startup (@ 0.7 lb)
26:00	Leveled coal bed (2.1 lb)
27:00	Loaded high burn fuel
105:00	Leveled coal bed (6.0 lb)

Test Notes
Test Burn Start Time: 10:25
Air Control Setting: Fully Closed

Time	Notes
1:00	Fuel loaded, door closed
13:00	Air set
17:00	Changed filter A
18:00	Changed filter B
30:00	Fan on
60:00	Changed filter A

Test Burn End Time: 19:10

Flue Gas Concentration Measurement

Calibration Gas Values:
Span Gas CO_2 (%): 16.93 CO (%): 4.33
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	08:35	09:02	09:00	4/10 09:35	4/10 09:38	4/10 09:40
CO_2	0.01	10.01	16.93	0.00	10.03	16.95
CO	0.000	2.493	4.330	0.000	2.504	4.345

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

Technician Signature: Date: 4/19/2019

ASTM E3053 Wood Heater Run Sheets

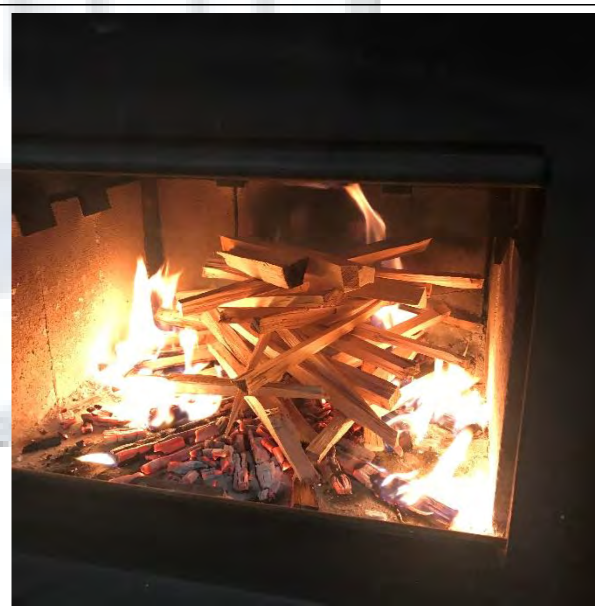
Client: FPI | Job Number: 19-469 | Tracking #: 0025
Model: I2450 | Run Number: 2 | Test Date: 4/9/2019

Test Photos

Kindling Fuel Load

Start-up Fuel Load

High Fire Fuel Load



Kindling Loaded

Technician Signature:

Date: 4/19/2019

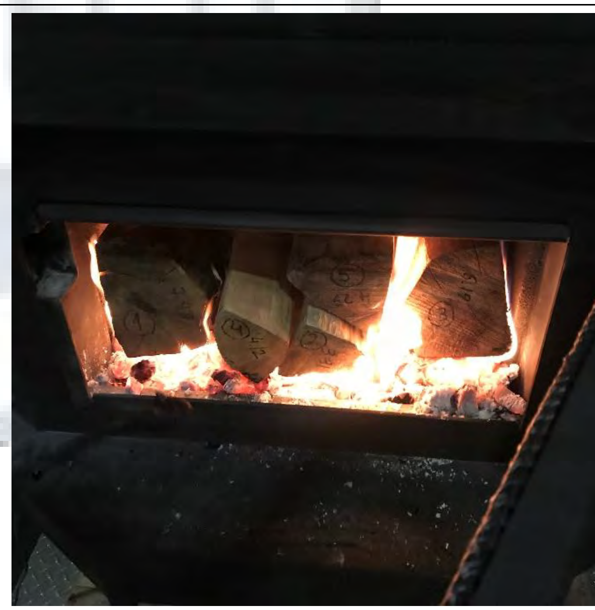
ASTM E3053 Wood Heater Run Sheets

Client: FPI
Job Number: 19-469
Tracking #: 0025
Model: I2450
Run Number: 2
Test Date: 4/9/2019

High Fire Fuel Loaded

Residual High Fire Load Coal Bed

Low Fire Fuel Load



Low Fire Fuel Loaded

Technician Signature: [signature]

Date: 4/19/2019

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 3 Data Summary

Client: FPI
Model: I2450
Job #: 19-469
Tracking #: 0025
Test Date: 4/10/2019

6/24/2021

Techician Signature | Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	3	Technician:	ADK/SJB
		Date:	4/10/2019

Incomplete Test Run - Results could not be computed

B415.1 Efficiency Results

Manufacturer:	FPI
Model:	I2450
Date:	04/10/19
Run:	3
Control #:	19-469
Test Duration:	90
Output Category:	Medium

Incomplete Test Run - Results could not be computed

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #	0025
Run #:	3	Technician:	ADK/SJB
		Date:	4/10/2019

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.24		
Target Load Weight (lbs):	22.40		
Total Load Weight Range (lbs):	21.30	to	23.50
Core Load Weight Range (lbs):	10.10	to	14.60
Remainder Load Weight Range (lbs):	7.80	to	12.30
Core Load Piece Range (lbs):	3.40	to	5.60
Remainder Load Piece Range (lbs):	2.20	to	12.30
Max Allowable Kindling Weight (lbs):	4.31		
Max Allowable Start-up Fuel Weight (lbs):	6.47		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	5.49	In Range	27.3	18.2	20.7	22.1	In Range	4.50	2.04
2	17.00	3.57	In Range	25.2	20.8	22.1	22.7	In Range	2.91	1.32
3	17.00	3.75	In Range	22.1	18.3	27.6	22.7	In Range	3.06	1.39
Core Load Wt. (lbs)		12.81	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	2.71	In Range	19.6	19.1	19.6	19.4	In Range	2.27	1.03
2	17.00	3.28	In Range	24.7	22.4	25.9	24.3	In Range	2.64	1.20
3	17.00	2.76	In Range	26.2	25.6	20.4	24.1	In Range	2.22	1.01
Remainder Load (lbs)		8.75	In Range							

Total Load Weight (lbs):	21.56	In Range	
Core Load % of Total Weight:	59%	In Range	45-65%
Remainder % of Total Weight:	41%	In Range	35-55%
Total Load % of Target Weight:	96%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	9.6		
Total Load Average Moisture Conent (%DB):	22.5	In Range	19-25%
Total Load Average Moisture Conent (%WB):	18.4		
Total Test Load Weight (dry basis):	17.60 lbs	7.98 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
3.17	In Range	10	10	10	10.0	In Range	2.88	1.31

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.12	In Range	23	25.5	26.2	24.9	In Range	3.30	1.50

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.2	to	4.3
Actual Residual Start-up Fuel Weight (lb):	2.2	In Range	

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #	0025
Run #:	3	Technician:	ADK/SJB
		Date:	4/10/2019

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.24		
Target Load Weight (lbs):	26.88		
Total Load Weight Range (lbs):	25.54	to	28.22
Core Load Weight Range (lbs):	12.10	to	17.47
Remainder Load Weight Range (lbs):	9.41	to	14.78
Core Load Piece Range (lbs):	4.03	to	6.72
Remainder Load Piece Range (lbs):	2.69	to	8.06

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	5.09	In Range	20.2	28.0	23.7	24.0	In Range	4.11	1.86
2	17.00	4.23	In Range	20.0	24.2	22.7	22.3	In Range	3.46	1.57
3	17.00	5.49	In Range	23.7	19.1	25.0	22.6	In Range	4.48	2.03
Core Load Wt. (lbs)		14.81	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	6.90	In Range	22.9	21.3	21.4	21.9	In Range	5.66	2.57
2	17.00	3.92	In Range	22.6	23.4	24.2	23.4	In Range	3.18	1.44
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		10.82	In Range							

Remainder Load Small/Large Piece Weight Ratio:	57%	In Range	≤ 67%
Total Load Weight (lbs):	25.63	In Range	
Core Load % of Total Weight:	58%	In Range	45-65%
Remainder % of Total Weight:	42%	In Range	35-55%
Total Load % of Target Weight:	95%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	11.4		
Total Load Average Moisture Conent (%DB):	22.7	In Range	19-25%
Total Load Average Moisture Conent (%WB):	18.5		
Total Test Load Weight (dry basis):	20.88 lbs	9.47 kg	

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	2.6	to	5.1
Actual Charcoal Bed Wt. (lb):	4.2	In Range	

TEST END POINT

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

Total Fuel Burned During Test Run:	25.6	lbs, wet basis
	20.9	lbs, dry basis
	9.47	kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	3	Technician:	ADK/SJB
Test Start Time:	11:43	Date:	4/10/2019
Test Type:	Medium Fire		

Recording Interval (min):	1	
Total Sampling Time (min):	90	
Meter Box γ Factor:	1.004	(A)
Meter Box γ Factor:	1.000	(B)
Meter Box γ Factor:	0.999	(Ambient)

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.36	30.36	30.36
Relative Humidity (%)	25.6	25.6	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		ft^3	

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/5/2019

Sample Train Post-Test Leak Checks

(A)	0.002	cfm @	-13	in. Hg
(B)	0.000	cfm @	-11	in. Hg
(Ambient)	0.000	cfm @		in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.056	143
2	0.064	142
3	0.058	142
4	0.050	140
5	0.056	139
6	0.066	138
7	0.064	138
8	0.052	138
Center	0.068	138

Static Pressure: -0.250 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	17.06	ft/sec
V_{scent}:	18.26	ft/sec
F_p:	0.934	[ratio]
Initial Tunnel Flow:	174.3	scf/min

TEST FUEL PROPERTIES

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

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

WOODSTOVE PREBURN DATA

Client: FPI
Model: I2450
Run #: 3

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/10/2019

Recording Interval (min): 1
Run Time (min): 132

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
0	1.8	0.003	85	85	86	83	87	85.2	82	70
1	1.7	-0.040	85	85	86	83	87	85.2	144	70
2	1.4	-0.073	93	87	87	83	87	87.4	352	70
3	1.0	-0.069	109	92	90	85	87	92.6	443	70
4	0.9	-0.076	125	103	93	87	87	99.0	388	70
5	0.8	-0.063	139	113	97	91	88	105.6	386	70
6	0.7	-0.062	152	124	101	97	90	112.8	368	70
7	0.4	-0.056	164	135	105	103	93	120.0	351	70
8	3.0	-0.071	176	146	109	110	98	127.8	375	70
9	2.7	-0.070	188	156	115	116	102	135.4	419	70
10	2.4	-0.066	199	168	121	123	107	143.6	434	70
11	2.3	-0.093	211	179	128	130	112	152.0	447	70
12	2.0	-0.085	225	190	135	139	118	161.4	469	70
13	1.8	-0.088	241	202	141	148	123	171.0	488	72
14	1.6	-0.086	256	216	148	159	128	181.4	495	72
15	1.6	-0.083	272	230	155	171	134	192.4	490	71
16	1.3	-0.077	286	245	162	183	140	203.2	485	71
17	1.2	-0.073	299	260	169	195	146	213.8	491	71
18	1.0	-0.078	313	274	177	206	151	224.2	487	71
19	5.0	-0.088	326	287	186	217	158	234.8	552	71
20	3.4	-0.086	339	301	194	229	164	245.4	523	73
21	3.1	-0.093	351	311	203	240	170	255.0	545	74
22	2.8	-0.082	362	321	212	251	175	264.2	563	75
23	2.6	-0.086	373	330	221	266	181	274.2	581	75
24	2.4	-0.075	385	339	230	280	187	284.2	591	75
25	7.0	-0.097	396	348	238	295	193	294.0	657	75
26	23.3	-0.091	409	360	251	311	199	306.0	574	75
27	23.1	-0.087	417	369	260	325	205	315.2	557	76
28	22.9	-0.092	422	376	267	336	211	322.4	574	76
29	22.6	-0.087	427	379	274	346	215	328.2	590	76
30	22.4	-0.094	430	381	279	355	220	333.0	601	76
31	22.1	-0.082	433	381	283	366	225	337.6	596	76
32	21.9	-0.079	438	380	286	376	229	341.8	608	76
33	21.6	-0.094	442	380	289	387	234	346.4	634	76
34	21.3	-0.095	446	380	290	398	238	350.4	652	76
35	21.0	-0.098	452	382	291	411	241	355.4	660	76
36	20.7	-0.104	457	385	293	421	245	360.2	666	77
37	20.4	-0.095	462	389	294	432	249	365.2	664	77
38	20.1	-0.093	467	394	296	442	252	370.2	678	77
39	19.8	-0.101	472	399	297	450	256	374.8	679	77
40	19.5	-0.101	477	404	299	458	259	379.4	692	77
41	19.2	-0.098	482	409	300	464	262	383.4	685	77
42	18.9	-0.092	487	415	303	473	265	388.6	686	77
43	18.6	-0.091	492	422	305	479	269	393.4	684	77

WOODSTOVE PREBURN DATA

Client: FPI
Model: I2450
Run #: 3

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/10/2019

Recording Interval (min): 1
Run Time (min): 132

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	Temperatures (°F) FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
44	18.3	-0.095	497	428	307	486	272	398.0	692	77
45	18.0	-0.092	501	434	309	491	275	402.0	690	77
46	17.7	-0.090	506	437	311	499	276	405.8	673	78
47	17.5	-0.093	511	441	310	502	278	408.4	669	78
48	17.3	-0.101	514	446	309	501	279	409.8	663	78
49	16.9	-0.097	518	450	307	496	280	410.2	657	78
50	16.6	-0.095	521	454	306	491	282	410.8	653	78
51	16.4	-0.091	524	458	305	486	283	411.2	646	78
52	16.1	-0.091	527	461	304	479	285	411.2	641	78
53	15.9	-0.087	529	465	303	468	286	410.2	636	78
54	15.6	-0.096	531	468	301	463	288	410.2	629	78
55	15.4	-0.086	533	470	300	460	290	410.6	625	78
56	15.1	-0.098	534	472	300	453	291	410.0	627	78
57	14.9	-0.097	536	474	299	449	293	410.2	624	79
58	14.6	-0.083	537	476	298	446	295	410.4	625	79
59	14.4	-0.087	538	479	298	442	296	410.6	629	79
60	14.1	-0.084	540	480	298	438	298	410.8	628	79
61	13.9	-0.085	542	483	297	437	299	411.6	632	79
62	13.6	-0.093	544	485	297	434	301	412.2	633	79
63	13.4	-0.088	546	488	297	434	304	413.8	634	79
64	13.1	-0.096	548	490	298	434	305	415.0	639	79
65	12.9	-0.094	550	492	297	434	306	415.8	638	80
66	12.6	-0.088	552	494	298	436	309	417.8	635	79
67	12.4	-0.090	554	497	298	437	310	419.2	632	80
68	12.1	-0.089	557	498	299	438	312	420.8	632	80
69	11.9	-0.098	559	500	299	439	313	422.0	630	80
70	11.7	-0.082	562	502	300	440	315	423.8	629	80
71	11.4	-0.085	563	504	301	441	316	425.0	624	80
72	11.1	-0.092	565	506	302	442	318	426.6	623	80
73	11.0	-0.098	567	507	303	442	320	427.8	617	80
74	10.8	-0.077	568	509	304	442	321	428.8	616	80
75	10.6	-0.102	570	511	305	440	323	429.8	610	80
76	10.3	-0.088	571	512	305	441	324	430.6	604	80
77	10.2	-0.092	572	513	307	440	326	431.6	599	80
78	10.0	-0.087	573	515	308	439	328	432.6	593	80
79	9.8	-0.089	573	517	308	437	330	433.0	594	80
80	9.7	-0.091	573	518	309	433	331	432.8	584	80
81	9.5	-0.089	573	519	310	431	333	433.2	585	80
82	9.3	-0.087	573	521	311	428	334	433.4	590	81
83	9.2	-0.075	572	522	311	424	335	432.8	586	81
84	8.9	-0.084	572	523	312	420	337	432.8	587	81
85	8.8	-0.088	571	525	313	417	338	432.8	590	81
86	8.6	-0.095	570	526	314	412	340	432.4	583	81
87	8.5	-0.082	570	527	315	413	341	433.2	583	81

WOODSTOVE PREBURN DATA

Client: FPI
Model: I2450
Run #: 3

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/10/2019

Recording Interval (min): 1
Run Time (min): 132

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
88	8.3	-0.085	569	528	316	410	342	433.0	585	81
89	8.1	-0.078	569	529	317	407	343	433.0	578	81
90	8.0	-0.087	569	530	318	403	344	432.8	575	81
91	7.8	-0.085	568	530	319	404	346	433.4	574	81
92	7.7	-0.085	568	531	320	399	346	432.8	572	81
93	7.6	-0.088	568	532	321	397	347	433.0	566	81
94	7.5	-0.086	568	533	322	393	349	433.0	560	81
95	7.3	-0.089	567	533	323	391	350	432.8	554	81
96	7.2	-0.080	566	533	324	387	351	432.2	546	81
97	7.1	-0.067	565	534	325	383	352	431.8	543	81
98	7.0	-0.086	563	534	326	379	353	431.0	541	81
99	6.8	-0.081	562	535	327	376	354	430.8	538	81
100	6.7	-0.078	561	535	328	373	356	430.6	539	81
101	6.7	-0.085	560	536	329	369	356	430.0	538	79
102	6.5	-0.086	558	536	329	367	357	429.4	530	78
103	6.4	-0.083	557	535	330	363	358	428.6	521	77
104	6.3	-0.084	555	535	330	361	359	428.0	512	77
105	6.3	-0.069	554	534	331	357	360	427.2	509	77
106	6.1	-0.088	552	533	332	354	361	426.4	533	77
107	6.0	-0.078	551	532	332	350	364	425.8	546	77
108	5.9	-0.079	551	531	332	347	366	425.4	546	76
109	5.8	-0.076	552	530	333	348	366	425.8	535	76
110	5.7	-0.099	552	530	334	349	367	426.4	523	76
111	5.6	-0.087	553	529	335	349	367	426.6	515	76
112	5.5	-0.083	554	528	336	349	367	426.8	509	76
113	5.5	-0.085	555	527	338	349	366	427.0	503	76
114	5.4	-0.073	556	526	339	348	366	427.0	498	76
115	5.3	-0.063	555	524	340	346	365	426.0	491	76
116	5.2	-0.077	554	523	341	343	364	425.0	486	76
117	5.2	-0.073	552	522	342	340	365	424.2	480	76
118	5.2	-0.077	550	520	343	336	364	422.6	474	76
119	5.1	-0.075	547	519	343	331	363	420.6	469	76
120	5.0	-0.078	544	517	343	328	363	419.0	466	76
121	5.0	-0.075	540	515	343	323	363	416.8	464	76
122	4.9	-0.077	537	512	343	320	363	415.0	460	76
123	4.9	-0.067	533	510	342	316	363	412.8	460	76
124	4.9	-0.068	530	508	341	312	363	410.8	456	76
125	4.8	-0.071	526	506	340	308	362	408.4	451	76
126	4.8	-0.067	523	504	339	304	362	406.4	447	76
127	4.7	-0.070	520	502	338	301	362	404.6	445	76
128	4.7	-0.064	517	500	337	298	361	402.6	441	76
129	4.6	-0.052	514	498	336	294	361	400.6	434	76
130	4.6	-0.067	510	496	334	291	360	398.2	426	75
131	4.5	-0.063	507	493	333	287	360	396.0	419	75

WOODSTOVE PREBURN DATA

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	3	Technician:	ADK/SJB
		Date:	4/10/2019

Recording Interval (min):	1
Run Time (min):	132

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
132	4.6	-0.065	504	491	332	284	359	394.0	415	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	3	Technician:	ADK/SJB
		Date:	4/10/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.003		0.069	0.02	85	-0.09		25.5		126	410	85	82
1	0.107	0.104	0.073	2.32	85	-0.68	73	25.5	0	134	361	84	82
2	0.252	0.145	0.066	2.27	85	-0.02	107	25.3	-0.2	126	391	85	81
3	0.401	0.149	0.069	2.24	85	-1.09	108	25.1	-0.2	127	435	85	81
4	0.547	0.146	0.067	2.24	85	-0.07	107	24.7	-0.4	131	500	85	82
5	0.697	0.150	0.073	2.23	84	-2.2	106	24.5	-0.2	137	558	86	81
6	0.840	0.143	0.067	2.20	85	-1.75	106	24.2	-0.3	141	597	86	81
7	0.989	0.149	0.065	2.22	85	-2.52	112	23.9	-0.3	144	613	86	81
8	1.131	0.142	0.067	2.08	85	-1.25	106	23.5	-0.4	147	636	86	81
9	1.263	0.132	0.065	1.47	85	-3.59	100	23.2	-0.3	144	603	86	81
10	1.403	0.140	0.074	3.12	85	-1.26	99	23.0	-0.2	139	556	84	81
11	1.524	0.121	0.069	0.01	85	-1.22	88	22.9	-0.1	135	520	86	81
12	1.620	0.096	0.073	2.32	85	-1.71	68	22.7	-0.2	130	480	86	82
13	1.770	0.150	0.071	2.31	85	-1.1	107	22.6	-0.1	130	472	86	81
14	1.915	0.145	0.072	2.29	86	-0.92	102	22.5	-0.1	129	476	86	82
15	2.066	0.151	0.068	2.30	85	-0.25	110	22.4	-0.1	129	479	87	81
16	2.211	0.145	0.068	2.29	86	0	105	22.2	-0.2	128	483	86	81
17	2.361	0.150	0.070	2.28	85	-0.61	107	22.1	-0.1	127	476	86	82
18	2.506	0.145	0.065	2.28	86	-1.72	108	21.9	-0.2	126	471	86	82
19	2.657	0.151	0.066	2.28	86	0	111	21.8	-0.1	125	458	86	81
20	2.802	0.145	0.062	2.28	86	0	110	21.6	-0.2	125	451	86	82
21	2.953	0.151	0.068	2.27	86	0	109	21.5	-0.1	123	449	86	81
22	3.098	0.145	0.070	2.27	86	-2.55	103	21.4	-0.1	123	447	86	81
23	3.249	0.151	0.068	2.26	86	-1.14	109	21.3	-0.1	125	444	86	82
24	3.394	0.145	0.064	2.30	87	0	108	21.2	-0.1	122	438	86	82
25	3.545	0.151	0.070	2.27	86	0	108	21.1	-0.1	122	435	86	81
26	3.689	0.144	0.068	2.27	86	-0.9	104	20.9	-0.2	122	430	85	81
27	3.840	0.151	0.068	2.27	87	-0.81	109	20.8	-0.1	121	422	85	81
28	3.986	0.146	0.068	2.26	87	0	105	20.6	-0.2	120	416	85	81
29	4.135	0.149	0.065	2.26	87	-2.56	110	20.6	0	121	413	86	81
30	4.281	0.146	0.071	2.25	87	0	103	20.4	-0.2	119	409	85	81
31	4.430	0.149	0.070	2.25	87	-2.34	106	20.4	0	118	408	85	82
32	4.576	0.146	0.069	2.26	87	0	104	20.3	-0.1	118	402	85	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	3	Technician:	ADK/SJB
		Date:	4/10/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.725	0.149	0.070	2.23	87	-0.47	105	20.3	0	116	398	85	81
34	4.870	0.145	0.068	2.24	87	-2.22	104	20.1	-0.2	116	394	86	81
35	5.019	0.149	0.069	2.21	87	0	106	20.0	-0.1	116	388	86	81
36	5.167	0.148	0.071	2.35	87	-0.21	104	19.9	-0.1	115	384	86	81
37	5.317	0.150	0.067	2.28	88	-1.09	108	19.8	-0.1	115	382	86	81
38	5.466	0.149	0.066	2.28	88	-0.57	108	19.7	-0.1	114	379	86	82
39	5.615	0.149	0.070	2.26	88	0	105	19.6	-0.1	114	376	86	81
40	5.765	0.150	0.074	2.25	88	-0.34	103	19.5	-0.1	114	373	87	81
41	5.912	0.147	0.071	2.25	88	-2.73	103	19.3	-0.2	114	371	87	81
42	6.062	0.150	0.069	2.34	88	0	106	19.3	0	114	368	86	82
43	6.209	0.147	0.072	2.32	88	-0.41	102	19.2	-0.1	113	366	87	81
44	6.362	0.153	0.068	2.31	88	0	109	19.0	-0.2	113	364	86	81
45	6.508	0.146	0.072	2.28	88	0	101	19.0	0	113	362	86	81
46	6.661	0.153	0.070	2.30	88	-2.75	108	18.9	-0.1	113	361	86	81
47	6.807	0.146	0.062	2.29	88	-2.45	109	18.7	-0.2	112	362	86	81
48	6.961	0.154	0.070	2.28	88	-0.25	108	18.6	-0.1	112	358	85	81
49	7.108	0.147	0.066	2.29	89	0	106	18.5	-0.1	111	354	86	81
50	7.260	0.152	0.071	2.28	88	-0.01	106	18.4	-0.1	111	350	85	81
51	7.408	0.148	0.069	2.30	89	-0.04	105	18.3	-0.1	111	348	85	81
52	7.558	0.150	0.071	2.28	89	-2.8	104	18.2	-0.1	111	350	85	81
53	7.705	0.147	0.070	2.31	88	-0.84	103	18.2	0	111	348	85	81
54	7.856	0.151	0.071	2.27	89	-0.01	105	18.1	-0.1	110	343	85	80
55	8.003	0.147	0.068	2.25	89	-2.55	104	18.0	-0.1	109	339	85	81
56	8.152	0.149	0.068	2.26	89	-0.04	106	17.9	-0.1	109	336	85	81
57	8.301	0.149	0.066	2.24	89	-0.28	108	17.8	-0.1	110	335	85	81
58	8.450	0.149	0.070	2.24	89	-1.08	104	17.7	-0.1	110	334	85	81
59	8.599	0.149	0.075	2.21	89	-0.02	101	17.6	-0.1	109	332	86	81
60	8.746	0.147	0.070	2.23	89	-2.77	103	17.5	-0.1	109	331	86	81
61	8.895	0.149	0.066	2.23	89	-0.74	108	17.4	-0.1	110	340	86	81
62	9.042	0.147	0.075	2.21	89	-0.96	100	17.3	-0.1	110	346	86	81
63	9.191	0.149	0.065	2.21	89	-0.86	108	17.2	-0.1	109	346	86	81
64	9.337	0.146	0.064	2.22	89	-0.47	107	17.1	-0.1	109	347	86	81
65	9.486	0.149	0.068	2.19	89	-2.88	106	17.0	-0.1	109	348	86	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	3	Technician:	ADK/SJB
		Date:	4/10/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.632	0.146	0.069	2.19	89	-0.7	103	16.8	-0.2	109	352	86	80
67	9.781	0.149	0.069	2.19	89	-2.43	105	16.7	-0.1	109	353	86	80
68	9.926	0.145	0.065	2.31	89	-1.12	105	16.6	-0.1	110	357	86	81
69	10.078	0.152	0.066	2.30	90	-1.14	109	16.5	-0.1	109	357	86	80
70	10.225	0.147	0.068	2.30	89	-2.49	104	16.4	-0.1	109	366	85	81
71	10.377	0.152	0.062	2.30	89	-2.82	113	16.2	-0.2	111	376	86	81
72	10.525	0.148	0.065	2.31	90	-2.36	108	16.2	0	112	382	84	81
73	10.684	0.159	0.070	2.27	89	-0.33	112	16.1	-0.1	112	388	85	81
74	10.831	0.147	0.068	2.30	89	-2.54	105	15.9	-0.2	112	394	85	81
75	10.982	0.151	0.073	2.28	90	0	104	15.8	-0.1	113	400	85	80
76	11.131	0.149	0.070	2.28	90	0	105	15.7	-0.1	114	408	85	80
77	11.282	0.151	0.073	2.28	90	-2.08	104	15.5	-0.2	114	417	86	81
78	11.432	0.150	0.072	2.28	90	0	104	15.4	-0.1	117	444	86	81
79	11.581	0.149	0.074	2.27	90	-2.59	102	15.1	-0.3	118	464	86	81
80	11.732	0.151	0.066	2.25	90	0	110	14.9	-0.2	121	475	86	80
81	11.878	0.146	0.073	2.19	90	0	101	14.7	-0.2	122	485	86	81
82	12.027	0.149	0.068	2.06	90	-2.11	107	14.5	-0.2	122	493	87	81
83	12.161	0.134	0.063	1.45	90	-1.42	100	14.2	-0.3	124	501	86	81
84	12.253	0.092	0.075	0.45	90	-6.12	63	14.0	-0.2	126	505	86	81
85	12.308	0.055	0.073	0.27	90	-6.13	38	13.8	-0.2	125	508	86	81
86	12.361	0.053	0.069	0.49	90	-11.1	38	13.6	-0.2	125	508	86	81
87	12.427	0.066	0.068	0.35	90	-12.31	48	13.3	-0.3	126	509	86	81
88	12.484	0.057	0.064	0.32	90	-12.19	42	13.3	0	126	509	85	81
89	12.541	0.057	0.067	0.28	90	-12.43	41	13.0	-0.3	126	509	85	81
90	12.591	0.050	0.068	0.27	90	-13.13	36	12.9	-0.1	125	507	85	81
Avg/Tot	12.591	0.140	0.069	2.06	88	-1.76	100			119	421	86	81.1

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 3

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/10/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.001		0.00	83	-1		86	0.000	4.30	0.34
1	0.098	0.097	2.27	83	-1.83	70	86	-0.060	3.60	0.35
2	0.243	0.145	2.21	83	-0.61	109	85	-0.070	2.60	0.31
3	0.386	0.143	2.19	83	-0.5	105	86	-0.080	3.56	0.74
4	0.534	0.148	2.28	83	-2.52	111	86	-0.080	5.54	0.87
5	0.679	0.145	2.27	83	-2.94	104	87	-0.080	7.91	0.79
6	0.826	0.147	2.25	83	-1.42	111	87	-0.090	9.85	0.83
7	0.970	0.144	2.22	84	-1.86	110	86	-0.090	10.82	0.83
8	1.114	0.144	2.10	84	-1.71	109	86	-0.090	11.14	1.03
9	1.245	0.131	1.66	84	-4.17	100	86	-0.090	11.33	1.23
10	1.388	0.143	2.11	84	-3.12	102	85	-0.080	11.38	1.33
11	1.529	0.141	2.21	84	-3.54	104	86	-0.080	9.59	0.62
12	1.674	0.145	2.06	85	-3.63	103	87	-0.080	7.53	0.29
13	1.807	0.133	1.78	85	-4.09	96	86	-0.080	5.61	0.45
14	1.969	0.162	2.18	85	-1.08	116	86	-0.080	4.35	0.57
15	2.113	0.144	2.25	86	-0.64	106	87	-0.070	4.96	0.45
16	2.262	0.149	2.27	86	-2.05	110	87	-0.080	5.38	0.41
17	2.406	0.144	2.27	86	-2.55	104	87	-0.080	5.70	0.38
18	2.555	0.149	2.27	87	-1.75	112	87	-0.080	6.12	0.41
19	2.699	0.144	2.25	87	-2.94	107	87	-0.080	6.27	0.36
20	2.848	0.149	2.26	87	-0.89	114	87	-0.070	6.25	0.32
21	2.993	0.145	2.25	88	-0.5	106	87	-0.060	5.95	0.32
22	3.141	0.148	2.25	88	-2.65	107	86	-0.070	5.62	0.38
23	3.286	0.145	2.24	88	-2.94	106	86	-0.060	5.76	0.33
24	3.435	0.149	2.25	89	-0.47	112	86	-0.080	5.60	0.41
25	3.580	0.145	2.23	89	-0.53	104	87	-0.070	5.03	0.54
26	3.728	0.148	2.24	90	-0.49	108	87	-0.060	5.02	0.58
27	3.873	0.145	2.24	90	-2.83	105	87	-0.070	4.85	0.61
28	4.022	0.149	2.23	90	-0.66	108	86	-0.070	4.68	0.62
29	4.167	0.145	2.23	90	-0.56	108	87	-0.080	4.35	0.58
30	4.316	0.149	2.25	91	-0.48	106	86	-0.070	4.39	0.62
31	4.460	0.144	2.23	91	-0.53	103	86	-0.070	4.44	0.60

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 3

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/10/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.609	0.149	2.24	92	-2.34	107	87	-0.060	4.30	0.65
33	4.754	0.145	2.24	92	-0.54	103	87	-0.080	4.42	0.61
34	4.903	0.149	2.23	92	-0.61	107	87	-0.070	4.84	0.56
35	5.047	0.144	2.23	92	-1.24	103	86	-0.060	4.72	0.61
36	5.196	0.149	2.23	93	-0.61	105	86	-0.070	4.57	0.59
37	5.340	0.144	2.22	93	-1.94	104	86	-0.070	4.48	0.61
38	5.489	0.149	2.21	93	-0.62	109	87	-0.070	4.67	0.55
39	5.633	0.144	2.23	94	-1.23	102	86	-0.060	4.71	0.57
40	5.782	0.149	2.21	94	-2.74	102	86	-0.050	4.62	0.59
41	5.926	0.144	2.20	94	-1.25	101	87	-0.060	4.73	0.56
42	6.077	0.151	2.23	95	-0.55	107	87	-0.060	4.67	0.59
43	6.223	0.146	2.28	95	-2.98	101	87	-0.070	4.70	0.58
44	6.373	0.150	2.26	95	-0.57	107	86	-0.040	4.81	0.53
45	6.519	0.146	2.25	95	-2.89	101	86	-0.060	4.64	0.57
46	6.670	0.151	2.27	96	-2.22	106	86	-0.060	4.79	0.54
47	6.816	0.146	2.25	96	-0.92	109	86	-0.050	4.71	0.54
48	6.966	0.150	2.25	96	-1.35	105	86	-0.070	4.62	0.55
49	7.112	0.146	2.24	96	-0.77	106	86	-0.050	4.70	0.55
50	7.262	0.150	2.24	97	-2.75	104	86	-0.060	4.84	0.52
51	7.407	0.145	2.25	97	-0.67	102	87	-0.060	4.60	0.58
52	7.558	0.151	2.23	97	-0.69	105	87	-0.060	4.34	0.62
53	7.703	0.145	2.24	98	-1.07	101	87	-0.070	4.56	0.61
54	7.853	0.150	2.24	98	-2.88	104	86	-0.060	4.66	0.56
55	7.998	0.145	2.23	98	-2.7	103	86	-0.050	4.71	0.57
56	8.148	0.150	2.21	98	-3.11	106	86	-0.060	4.47	0.58
57	8.293	0.145	2.21	98	-0.82	104	86	-0.050	4.53	0.60
58	8.442	0.149	2.21	98	-1.28	104	86	-0.070	4.31	0.62
59	8.587	0.145	2.21	99	-1.43	98	86	-0.060	4.45	0.60
60	8.736	0.149	2.21	99	-2.69	104	87	-0.050	4.54	0.62
61	8.880	0.144	2.21	99	-2.98	103	86	-0.060	4.67	0.62
62	9.029	0.149	2.19	99	-1.28	100	86	-0.050	4.86	0.63
63	9.174	0.145	2.19	100	-3.14	105	86	-0.060	5.19	0.54

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	3	Technician:	ADK/SJB
		Date:	4/10/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.322	0.148	2.17	100	-3.09	108	86	-0.060	5.18	0.56
65	9.467	0.145	2.18	100	-3.21	102	86	-0.060	5.29	0.57
66	9.615	0.148	2.19	100	-3.15	104	86	-0.050	5.34	0.59
67	9.759	0.144	2.17	100	-0.83	101	87	-0.070	5.30	0.62
68	9.908	0.149	2.30	100	-1.31	108	87	-0.060	5.50	0.57
69	10.055	0.147	2.27	101	-0.88	105	86	-0.070	5.68	0.55
70	10.207	0.152	2.29	101	-1.1	107	86	-0.070	5.56	0.59
71	10.355	0.148	2.27	101	-1.95	109	86	-0.070	5.92	0.51
72	10.506	0.151	2.28	101	-2.99	109	86	-0.070	6.21	0.42
73	10.655	0.149	2.27	101	-3.26	104	86	-0.070	6.54	0.33
74	10.805	0.150	2.26	101	-1.36	106	86	-0.070	6.76	0.28
75	10.955	0.150	2.26	101	-0.95	102	86	-0.070	7.01	0.23
76	11.103	0.148	2.27	101	-2.82	103	87	-0.070	7.11	0.20
77	11.253	0.150	2.27	102	-2.2	102	87	-0.050	7.21	0.17
78	11.401	0.148	2.24	102	-1.99	102	86	-0.080	7.75	0.13
79	11.550	0.149	2.19	102	-1.41	101	86	-0.060	9.06	0.33
80	11.693	0.143	1.99	102	-1.75	103	86	-0.080	10.08	0.77
81	11.825	0.132	1.45	102	-5.04	91	86	-0.070	10.53	1.09
82	11.931	0.106	0.87	102	-6.6	75	86	-0.070	10.58	1.20
83	12.014	0.083	0.60	102	-7.7	61	87	-0.080	10.51	1.28
84	12.087	0.073	0.48	102	-6.57	50	87	-0.070	10.54	1.22
85	12.156	0.069	0.42	103	-6.95	47	87	-0.070	10.51	1.01
86	12.224	0.068	0.88	103	-7.76	48	86	-0.080	10.21	0.76
87	12.312	0.088	0.78	103	-8.42	63	86	-0.090	9.84	0.62
88	12.399	0.087	0.74	103	-10.01	64	86	-0.080	9.70	0.49
89	12.483	0.084	0.70	103	-9.32	60	86	-0.090	9.36	0.44
90	12.568	0.085	0.69	103	-9.6	61	86	-0.080	9.31	0.34
Avg/Tot	12.568	0.140	2.03	94	-2.45	100			6.16	0.58

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 3

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/10/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	500	490	330	280	361	392.2	N/A
1	496	490	335	277	364	392.4	N/A
2	492	488	339	273	365	391.4	N/A
3	484	483	342	270	367	389.2	N/A
4	477	477	343	269	368	386.8	N/A
5	468	471	343	272	369	384.6	N/A
6	463	465	343	277	369	383.4	N/A
7	460	459	342	284	369	382.8	N/A
8	458	454	341	297	370	384.0	N/A
9	458	451	340	309	372	386.0	N/A
10	459	450	339	324	374	389.2	N/A
11	461	449	338	338	375	392.2	N/A
12	462	448	337	349	376	394.4	N/A
13	462	446	336	357	377	395.6	N/A
14	460	443	334	361	377	395.0	N/A
15	457	440	333	363	377	394.0	N/A
16	452	437	331	363	378	392.2	N/A
17	447	435	330	364	379	391.0	N/A
18	443	433	328	361	379	388.8	N/A
19	440	431	326	362	379	387.6	N/A
20	436	431	325	360	379	386.2	N/A
21	432	430	323	362	380	385.4	N/A
22	428	430	321	363	380	384.4	N/A
23	424	428	320	363	379	382.8	N/A
24	420	427	318	362	379	381.2	N/A
25	416	426	316	361	379	379.6	N/A
26	413	424	314	359	379	377.8	N/A
27	410	422	313	356	378	375.8	N/A
28	407	420	311	351	378	373.4	N/A
29	405	417	309	346	377	370.8	N/A
30	402	414	308	342	376	368.4	N/A
31	399	411	306	339	376	366.2	N/A
32	397	409	304	337	375	364.4	N/A
33	394	406	302	333	373	361.6	N/A
34	392	404	299	330	371	359.2	N/A
35	390	401	295	326	369	356.2	N/A
36	387	399	292	321	367	353.2	N/A
37	385	397	289	315	365	350.2	N/A
38	382	394	286	310	363	347.0	N/A
39	380	392	282	306	362	344.4	N/A
40	377	390	279	299	360	341.0	N/A
41	374	388	276	295	358	338.2	N/A
42	372	385	274	291	356	335.6	N/A
43	369	383	271	286	354	332.6	N/A
44	367	381	268	282	353	330.2	N/A
45	365	379	266	279	351	328.0	N/A
46	362	376	264	275	349	325.2	N/A
47	360	374	261	272	348	323.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 3

Job #: 19-469
Tracking #: 0025
Technician: ADK/SJB
Date: 4/10/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	357	372	259	269	346	320.6	N/A
49	356	370	257	266	344	318.6	N/A
50	354	368	255	263	343	316.6	N/A
51	352	366	253	260	342	314.6	N/A
52	351	363	251	258	340	312.6	N/A
53	349	361	250	256	338	310.8	N/A
54	347	358	248	254	337	308.8	N/A
55	346	357	246	252	336	307.4	N/A
56	345	354	245	250	334	305.6	N/A
57	343	352	243	248	333	303.8	N/A
58	341	350	242	247	332	302.4	N/A
59	340	348	241	245	330	300.8	N/A
60	338	346	239	244	329	299.2	N/A
61	337	345	238	243	327	298.0	N/A
62	335	343	238	242	326	296.8	N/A
63	334	341	236	241	324	295.2	N/A
64	333	340	235	242	323	294.6	N/A
65	332	339	234	241	322	293.6	N/A
66	331	339	234	241	320	293.0	N/A
67	330	339	233	241	319	292.4	N/A
68	329	340	232	241	318	292.0	N/A
69	329	340	231	242	317	291.8	N/A
70	329	341	231	242	316	291.8	N/A
71	329	342	230	243	315	291.8	N/A
72	329	343	230	245	313	292.0	N/A
73	329	345	230	247	312	292.6	N/A
74	330	347	229	249	311	293.2	N/A
75	331	349	229	253	310	294.4	N/A
76	332	352	229	256	309	295.6	N/A
77	334	353	229	260	308	296.8	N/A
78	336	356	229	265	307	298.6	N/A
79	340	359	230	271	306	301.2	N/A
80	345	363	230	279	306	304.6	N/A
81	353	367	232	289	304	309.0	N/A
82	362	372	234	297	304	313.8	N/A
83	372	378	237	309	303	319.8	N/A
84	382	383	240	321	302	325.6	N/A
85	393	389	244	332	302	332.0	N/A
86	403	395	248	344	301	338.2	N/A
87	412	401	252	354	300	343.8	N/A
88	421	406	256	363	299	349.0	N/A
89	429	411	260	371	299	354.0	N/A
90	437	417	265	379	298	359.2	N/A
Average	390	395	279	298	346	342	N/A

LAB SAMPLE DATA - ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	3	Technician:	ADK/SJB
		Date:	4/10/2019

Incomplete Test Run - Results could not be computed, filter samples were not weighed

ASTM E3053 Wood Heater Run Sheets

Client: FPI | Job Number: 19-469 | Tracking #: 0025
Model: I2450 | Run Number: 3 | Test Date: 4/10/2019

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 09:30
Air Control Setting: Fully Open

Time	Notes
0:00	Started PB with 1.8 lb, torch for 20 sec
2:40	Closed door (1.1 lb)
8:00	Loaded 2.4 lb of kindling & startup (@ 0.4 lb)
19:00	Loaded remaining 2.4 lb of startup (@ 0.9 lb)
24:00	Leveled coal bed (2.2 lb)
25:00	Loaded high burn fuel
105:00	Leveled coal bed (6.2 lb)
132:00	End PB

Test Notes
Test Burn Start Time: 11:43
Air Control Setting: Open to medium marking

Time	Notes
0:50	Fuel loaded, door closed
8:00	Air set halfway to test setting
13:00	Air set
17:00	Changed filter A
18:00	Changed filter B
30:00	Fan on
60:00	Changed filter A
87:00	Filters A and B clogged – Noticed too late to recover pro rates – **Test run aborted**

Test Burn End Time: 13:13

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 16.93 CO (%): 4.33
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	09:35	09:38	09:40	N/A	N/A	N/A
CO_2	0.00	10.03	16.95	N/A	N/A	N/A
CO	0.000	2.504	4.345	N/A	N/A	N/A

Flue Gas Probe Leak Check: Initial: No Leakage Final: N/A

Technician Signature:________________ Date: 6/24/2021

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 4 Data Summary

Client:	FPI
Model:	I2450
Job #:	19-469
Tracking #:	0025
Test Date:	4/11/2019

	4/19/2019
Techician Signature	Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	4	Technician:	ADK
		Date:	4/11/2019

Burn Rate (kg/hr):	**1.25**

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	53.274	70.888	70.227	8.813
Average Gas Velocity in Dilution Tunnel (ft/sec)				16.73
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)				10804.9
Average Gas Meter Temperature (°F)	80.9	91.0	104.8	87.1
Total Sample Volume (dscf)	51.997	68.644	66.067	8.593
Average Tunnel Temperature (°F)				106.8
Total Time of Test (min)				471
Total Particulate Catch (mg)	0.2	6.3	5.3	2.8
Particulate Concentration, dry-standard (g/dscf)	0.0000038	0.0000918	0.0000802	0.0003259
Total PM Emissions (g)	0.33	7.46	6.48	3.48
Particulate Emission Rate (g/hr)	0.04	0.95	0.83	3.48
Emissions Factor (g/kg)	-	0.76	0.66	-
Difference from Average Total Particulate Emissions (g)	-	0.49	0.49	-
Difference from Average Emissions Factor (g/kg)	-	0.05	0.05	-

Final Average Results	
Total Particulate Emissions (g)	6.97
Particulate Emission Rate (g/hr)	0.89
Emissions Factor (g/kg)	0.71
HHV Efficiency (%)	66.4%
LHV Efficiency (%)	71.0%
CO Emissions (g/min)	1.35

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 82 / Max: 89	OK
Face Velocity	< 30 ft/min	8.4	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 79 / Max: 85	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	CHECK 10 MIN. INTERVAL PRO-RATES

B415.1 Efficiency Results

Manufacturer:	FPI
Model:	I2450
Date:	04/11/19
Run:	4
Control #:	19-469
Test Duration:	471
Output Category:	Medium

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	66.4%	71.0%
Combustion Efficiency	95.9%	95.9%
Heat Transfer Efficiency	69.2%	74.0%

Output Rate (kJ/h)	16,410	15,567	**(Btu/h)**
Burn Rate (kg/h)	1.24	2.73	**(lb/h)**
Input (kJ/h)	24,708	23,439	**(Btu/h)**

Test Load Weight (dry kg)	9.72	21.42	**dry lb**
MC wet (%)	18.25		
MC dry (%)	22.33		
Particulate (g)	6.97		
CO (g)	638		
Test Duration (h)	7.85		

Emissions	Particulate	CO
g/MJ Output	0.05	4.95
g/kg Dry Fuel	0.72	65.66
g/h	0.89	81.28
g/min	0.01	1.35
lb/MM Btu Output	0.13	11.51

Air/Fuel Ratio (A/F)	24.98

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

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #	0025
Run #:	4	Technician:	ADK
		Date:	4/11/2019

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.24		
Target Load Weight (lbs):	22.40		
Total Load Weight Range (lbs):	21.30	to	23.50
Core Load Weight Range (lbs):	10.10	to	14.60
Remainder Load Weight Range (lbs):	7.80	to	12.30
Core Load Piece Range (lbs):	3.40	to	5.60
Remainder Load Piece Range (lbs):	2.20	to	12.30
Max Allowable Kindling Weight (lbs):	4.36		
Max Allowable Start-up Fuel Weight (lbs):	6.55		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	3.48	In Range	21.3	22.3	25.7	23.1	In Range	2.83	1.28
2	17.00	4.28	In Range	25.0	20.4	21.9	22.4	In Range	3.50	1.59
3	17.00	4.14	In Range	24.8	18.9	22.3	22.0	In Range	3.39	1.54
Core Load Wt. (lbs)		11.90	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	3.02	In Range	22.6	19.3	19.5	20.5	In Range	2.51	1.14
2	17.00	3.95	In Range	19.1	18.9	21.6	19.9	In Range	3.30	1.49
3	17.00	2.95	In Range	22.6	22.8	18.2	21.2	In Range	2.43	1.10
Remainder Load (lbs)		9.92	In Range							

Total Load Weight (lbs):	21.82	In Range	
Core Load % of Total Weight:	55%	In Range	45-65%
Remainder % of Total Weight:	45%	In Range	35-55%
Total Load % of Target Weight:	97%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	9.7		
Total Load Average Moisture Conent (%DB):	21.5	In Range	19-25%
Total Load Average Moisture Conent (%WB):	17.7		
Total Test Load Weight (dry basis):	17.95 lbs	8.14 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
3.04	In Range	10	10	10	10.0	In Range	2.76	1.25

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.01	In Range	22.9	21.7	24	22.9	In Range	3.26	1.48

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.2	to	4.4
Actual Residual Start-up Fuel Weight (lb):		2.2	In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #	0025
Run #:	4	Technician:	ADK
		Date:	4/11/2019

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.24		
Target Load Weight (lbs):	26.88		
Total Load Weight Range (lbs):	25.54	to	28.22
Core Load Weight Range (lbs):	12.10	to	17.47
Remainder Load Weight Range (lbs):	9.41	to	14.78
Core Load Piece Range (lbs):	4.03	to	6.72
Remainder Load Piece Range (lbs):	2.69	to	8.06

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	5.75	In Range	21.8	20.7	18.9	20.5	In Range	4.77	2.17
2	17.00	5.53	In Range	22.8	22.5	26.3	23.9	In Range	4.46	2.03
3	17.00	5.25	In Range	20.9	22.4	23.8	22.4	In Range	4.29	1.95
Core Load Wt. (lbs)		16.53	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	17.00	7.08	In Range	18.9	27.1	21.2	22.4	In Range	5.78	2.62
2	17.00	2.75	In Range	27.3	19.7	22.0	23.0	In Range	2.24	1.01
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		9.83	In Range							

Remainder Load Small/Large Piece Weight Ratio:	39%	In Range	≤ 67%
Total Load Weight (lbs):	26.36	In Range	
Core Load % of Total Weight:	63%	In Range	45-65%
Remainder % of Total Weight:	37%	In Range	35-55%
Total Load % of Target Weight:	98%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	11.8		
Total Load Average Moisture Conent (%DB):	22.3	In Range	19-25%
Total Load Average Moisture Conent (%WB):	18.3		
Total Test Load Weight (dry basis):	21.55 lbs		9.77 kg

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	2.7	to	5.2
Actual Charcoal Bed Wt. (lb):		4.6	In Range

TEST END POINT

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

Total Fuel Burned During Test Run:	26.4 lbs, wet basis
	21.5 lbs, dry basis
	9.77 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	4	Technician:	ADK
Test Start Time:		Date:	4/11/2019
Test Type:	Medium Fire		

Recording Interval (min):	1	
Total Sampling Time (min):	471	
Meter Box γ Factor:	1.004	(A)
Meter Box γ Factor:	1.000	(B)
Meter Box γ Factor:	0.999	(Ambient)

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.01	29.91	29.96
Relative Humidity (%)	25.0	31.8	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		53.274	ft^3

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/5/2019

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	14	in. Hg
(B)	0.000	cfm @	-18	in. Hg
(Ambient)	0.000	cfm @		in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.056	138
2	0.062	138
3	0.064	138
4	0.046	138
5	0.054	137
6	0.066	137
7	0.060	137
8	0.048	137
Center	0.067	137

Static Pressure: -0.250 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	16.94	ft/sec
V_{scent}:	18.22	ft/sec
F_p:	0.930	[ratio]
Initial Tunnel Flow:	171.5	scf/min

TEST FUEL PROPERTIES

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

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

WOODSTOVE PREBURN DATA

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	4	Technician:	ADK
		Date:	4/11/2019

Recording Interval (min): 1
Run Time (min): 116

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
0	1.4	-0.069	85	85	84	81	85	84.0	285	77
1	1.0	-0.075	99	92	86	82	85	88.8	462	77
2	0.9	-0.060	117	105	90	85	85	96.4	391	77
3	0.8	-0.057	131	118	94	88	87	103.6	350	77
4	0.7	-0.051	145	131	99	91	89	111.0	329	77
5	0.6	-0.060	159	142	103	95	92	118.2	319	77
6	2.6	-0.060	171	152	109	100	95	125.4	348	77
7	2.7	-0.064	185	161	115	104	99	132.8	421	77
8	2.4	-0.068	199	170	122	110	103	140.8	431	77
9	2.1	-0.077	214	180	129	117	107	149.4	447	77
10	2.0	-0.080	231	191	136	126	112	159.2	471	77
11	1.7	-0.090	247	204	144	137	117	169.8	494	77
12	1.5	-0.084	264	217	152	148	123	180.8	506	77
13	1.3	-0.063	281	231	161	161	129	192.6	516	77
14	1.1	-0.083	298	246	171	175	135	205.0	525	77
15	1.0	-0.080	313	261	181	189	141	217.0	512	77
16	0.8	-0.083	327	276	191	203	148	229.0	495	77
17	3.7	-0.084	339	291	200	218	155	240.6	501	77
18	3.4	-0.090	350	303	209	230	162	250.8	552	78
19	3.1	-0.095	361	315	218	243	168	261.0	554	78
20	2.8	-0.087	372	326	227	255	174	270.8	573	78
21	2.5	-0.087	384	336	236	270	181	281.4	587	77
22	2.2	-0.105	397	347	245	285	188	292.4	604	77
23	25.6	-0.089	410	358	256	305	197	305.2	651	77
24	23.3	-0.097	424	370	265	321	203	316.6	587	77
25	23.0	-0.083	434	381	273	335	209	326.4	588	78
26	22.7	-0.101	440	389	281	347	216	334.6	594	78
27	22.4	-0.091	447	394	288	359	222	342.0	601	78
28	22.1	-0.091	453	399	294	371	228	349.0	622	78
29	21.7	-0.090	458	403	299	383	233	355.2	642	78
30	21.4	-0.083	463	407	304	395	238	361.4	652	78
31	21.0	-0.109	468	412	309	406	243	367.6	659	78
32	20.7	-0.096	473	416	313	419	248	373.8	666	78
33	20.3	-0.103	478	421	317	431	252	379.8	677	78
34	20.0	-0.104	483	426	321	443	257	386.0	682	78
35	19.6	-0.098	488	431	324	455	261	391.8	687	78
36	19.3	-0.098	493	437	327	466	265	397.6	691	78
37	18.9	-0.110	499	442	330	478	270	403.8	694	79
38	18.6	-0.097	504	448	333	489	274	409.6	693	78
39	18.3	-0.092	510	453	337	496	277	414.6	701	78
40	17.9	-0.101	514	460	340	506	281	420.2	699	78
41	17.6	-0.102	520	464	343	513	285	425.0	701	77
42	17.3	-0.114	525	470	346	522	289	430.4	705	77
43	17.0	-0.097	531	475	349	529	293	435.4	706	76

WOODSTOVE PREBURN DATA

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	4	Technician:	ADK
		Date:	4/11/2019

Recording Interval (min): 1
Run Time (min): 116

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
44	16.7	-0.111	537	477	352	539	295	440.0	703	76
45	16.3	-0.078	543	481	352	539	297	442.4	699	76
46	16.1	-0.097	548	485	352	540	299	444.8	692	76
47	15.8	-0.093	553	489	351	537	301	446.2	687	76
48	15.4	-0.104	558	492	350	530	303	446.6	686	76
49	15.2	-0.091	563	496	349	528	305	448.2	682	76
50	14.9	-0.092	567	499	349	523	307	449.0	683	76
51	14.6	-0.091	571	502	349	519	309	450.0	681	76
52	14.3	-0.084	575	506	349	515	312	451.4	677	76
53	14.1	-0.092	579	509	349	512	314	452.6	677	76
54	13.8	-0.098	582	512	349	509	316	453.6	674	77
55	13.5	-0.089	586	515	350	506	318	455.0	671	76
56	13.2	-0.100	589	518	350	506	320	456.6	672	76
57	13.0	-0.097	593	521	351	504	323	458.4	673	76
58	12.7	-0.097	596	524	352	503	325	460.0	671	77
59	12.4	-0.087	600	528	353	501	326	461.6	670	77
60	12.2	-0.097	603	531	354	502	328	463.6	666	76
61	11.9	-0.091	606	533	355	501	331	465.2	668	76
62	11.7	-0.088	609	536	356	501	333	467.0	667	75
63	11.3	-0.094	612	539	357	500	335	468.6	670	75
64	11.1	-0.089	615	541	358	501	337	470.4	667	76
65	10.9	-0.099	618	543	359	502	339	472.2	662	75
66	10.7	-0.101	620	545	361	499	341	473.2	655	75
67	10.4	-0.081	622	547	363	502	343	475.4	655	75
68	10.2	-0.098	624	549	364	502	345	476.8	648	75
69	10.0	-0.095	626	551	366	501	346	478.0	648	76
70	9.8	-0.091	628	552	367	501	349	479.4	645	77
71	9.6	-0.093	629	554	369	499	350	480.2	641	77
72	9.4	-0.103	631	556	370	497	353	481.4	636	77
73	9.1	-0.077	632	557	371	493	354	481.4	628	77
74	9.0	-0.085	633	559	373	494	356	483.0	625	77
75	8.8	-0.086	634	560	375	490	359	483.6	617	77
76	8.7	-0.097	634	562	377	485	361	483.8	605	77
77	8.4	-0.091	634	563	378	480	362	483.4	593	77
78	8.5	-0.077	633	563	379	474	364	482.6	585	77
79	8.3	-0.074	631	564	380	468	366	481.8	578	77
80	8.2	-0.083	629	565	381	458	367	480.0	574	77
81	8.1	-0.081	626	565	382	453	369	479.0	570	77
82	7.9	-0.085	624	565	382	445	370	477.2	562	77
83	7.8	-0.086	621	564	382	438	371	475.2	555	77
84	7.7	-0.083	619	563	382	429	372	473.0	553	77
85	7.6	-0.073	616	562	383	424	373	471.6	549	77
86	7.5	-0.085	612	561	383	418	374	469.6	545	77
87	7.4	-0.083	610	560	383	410	375	467.6	541	77

WOODSTOVE PREBURN DATA

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

Recording Interval (min): 1
Run Time (min): 116

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	Temperatures (°F) FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
88	7.3	-0.087	607	558	383	403	376	465.4	538	78
89	7.2	-0.069	604	557	382	397	376	463.2	536	78
90	7.1	-0.092	602	556	382	391	377	461.6	532	78
91	7.0	-0.085	600	554	381	386	378	459.8	525	78
92	6.9	-0.077	597	553	381	380	379	458.0	521	78
93	6.8	-0.077	596	552	380	373	378	455.8	515	78
94	6.7	-0.083	594	551	379	367	379	454.0	511	78
95	6.6	-0.082	592	549	379	364	379	452.6	508	78
96	6.6	-0.074	590	548	379	358	380	451.0	503	78
97	6.5	-0.075	588	547	378	356	380	449.8	497	78
98	6.4	-0.091	586	545	377	351	380	447.8	491	78
99	6.2	-0.076	583	544	378	346	381	446.4	535	78
100	6.0	-0.079	582	543	378	344	381	445.6	546	78
101	5.9	-0.078	581	542	378	344	383	445.6	548	78
102	5.6	-0.079	581	542	378	347	383	446.2	542	78
103	5.6	-0.068	583	541	378	350	382	446.8	536	78
104	5.4	-0.077	584	541	379	355	382	448.2	530	78
105	5.4	-0.080	585	540	379	359	381	448.8	523	78
106	5.3	-0.085	587	539	380	360	380	449.2	521	78
107	5.2	-0.075	588	539	380	362	378	449.4	515	78
108	5.1	-0.084	588	537	381	364	376	449.2	510	78
109	5.2	-0.078	588	536	381	362	376	448.6	503	78
110	4.9	-0.073	588	535	382	362	374	448.2	500	78
111	4.8	-0.077	586	533	383	359	374	447.0	495	78
112	4.9	-0.082	585	530	383	357	373	445.6	491	78
113	4.8	-0.063	584	529	383	353	371	444.0	488	78
114	4.7	-0.077	582	527	384	348	370	442.2	486	78
115	4.7	-0.076	580	524	383	345	370	440.4	480	78
116	4.6	-0.077	578	523	383	341	369	438.8	474	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.065	0.00	85	-0.11		26.2		135	469	85	82
1	0.109	0.109	0.077	2.29	85	-2.62	71	26.2	0	138	441	86	82
2	0.254	0.145	0.069	2.25	85	-2.79	99	26.0	-0.2	133	472	86	82
3	0.403	0.149	0.066	2.23	85	-0.57	105	25.8	-0.2	138	550	86	82
4	0.547	0.144	0.066	2.32	85	-0.02	102	25.5	-0.3	142	592	86	82
5	0.697	0.150	0.074	2.25	85	-2.43	100	25.2	-0.3	145	607	87	81
6	0.840	0.143	0.070	2.15	85	-0.5	99	24.9	-0.3	148	615	87	82
7	0.990	0.150	0.065	2.24	85	-0.71	107	24.6	-0.3	150	634	87	81
8	1.132	0.142	0.075	2.20	85	-3.24	94	24.2	-0.4	146	606	87	81
9	1.283	0.151	0.075	2.35	85	-2.93	100	24.0	-0.2	144	587	87	82
10	1.430	0.147	0.063	2.32	85	-3.44	106	23.8	-0.2	141	563	87	81
11	1.580	0.150	0.069	2.24	86	-1.97	103	23.6	-0.2	138	552	87	81
12	1.725	0.145	0.064	2.35	86	-1.39	103	23.4	-0.2	137	544	87	82
13	1.875	0.150	0.074	2.21	86	-4.2	99	23.1	-0.3	137	542	87	83
14	2.021	0.146	0.067	2.26	85	-4.75	102	23.1	0	138	541	87	82
15	2.151	0.130	0.068	0.66	86	-2.26	90	22.8	-0.3	135	538	87	82
16	2.254	0.103	0.069	1.55	86	0	71	22.7	-0.1	135	541	84	81
17	2.406	0.152	0.069	2.59	86	-2.78	104	22.5	-0.2	134	541	86	82
18	2.561	0.155	0.074	2.29	86	-2.27	103	22.2	-0.3	134	540	87	82
19	2.707	0.146	0.064	2.26	86	-0.54	104	22.1	-0.1	134	540	86	82
20	2.856	0.149	0.069	2.28	86	-0.01	102	21.9	-0.2	134	541	86	82
21	3.002	0.146	0.062	2.22	87	-1.86	105	21.7	-0.2	134	541	87	81
22	3.152	0.150	0.067	2.26	86	-2.24	104	21.5	-0.2	133	540	86	83
23	3.299	0.147	0.068	2.25	87	-0.18	101	21.4	-0.1	133	539	86	81
24	3.447	0.148	0.071	2.26	86	-2.39	100	21.2	-0.2	133	538	86	82
25	3.594	0.147	0.077	2.24	87	-2.55	95	21.0	-0.2	133	537	86	82
26	3.743	0.149	0.067	2.30	86	-2.69	103	20.8	-0.2	133	537	86	83
27	3.894	0.151	0.065	2.29	87	-1.77	106	20.7	-0.1	133	541	86	82
28	4.042	0.148	0.068	2.28	87	-2.61	102	20.5	-0.2	132	541	86	82
29	4.193	0.151	0.074	2.28	87	-2.68	100	20.3	-0.2	133	541	86	83
30	4.340	0.147	0.068	2.23	87	-1.31	101	20.1	-0.2	132	542	86	82
31	4.491	0.151	0.079	2.27	87	-2.46	96	19.9	-0.2	132	538	86	82
32	4.637	0.146	0.069	2.26	87	-0.1	100	19.8	-0.1	131	537	86	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.788	0.151	0.073	2.27	87	-2.03	100	19.6	-0.2	133	535	86	82
34	4.933	0.145	0.065	2.26	88	-0.3	102	19.4	-0.2	133	532	85	82
35	5.084	0.151	0.072	2.22	87	0	101	19.1	-0.3	132	531	85	82
36	5.229	0.145	0.068	2.25	88	-2.73	100	19.1	0	132	529	85	82
37	5.381	0.152	0.073	2.26	88	-0.12	101	18.9	-0.2	131	531	85	82
38	5.528	0.147	0.066	2.27	88	-2.76	102	18.7	-0.2	131	528	85	82
39	5.681	0.153	0.071	2.29	88	-0.09	103	18.5	-0.2	132	526	85	82
40	5.827	0.146	0.065	2.27	88	-0.19	102	18.3	-0.2	131	525	85	82
41	5.978	0.151	0.064	2.25	88	-2.49	107	18.2	-0.1	131	524	85	82
42	6.125	0.147	0.066	2.26	88	-1.77	102	18.0	-0.2	130	522	86	82
43	6.275	0.150	0.066	2.26	89	-0.16	104	17.8	-0.2	130	521	86	82
44	6.422	0.147	0.079	2.25	89	-3.03	93	17.6	-0.2	132	518	86	82
45	6.572	0.150	0.062	2.23	88	-0.27	108	17.5	-0.1	132	518	87	82
46	6.719	0.147	0.067	2.22	89	-0.28	101	17.3	-0.2	132	516	86	82
47	6.869	0.150	0.070	2.29	89	-2.84	101	17.1	-0.2	132	516	87	83
48	7.020	0.151	0.070	2.27	88	-0.31	102	16.9	-0.2	132	516	86	83
49	7.170	0.150	0.063	2.27	89	-2.47	107	16.8	-0.1	132	513	86	82
50	7.320	0.150	0.063	2.25	89	-2.97	107	16.6	-0.2	131	514	86	83
51	7.468	0.148	0.075	2.26	89	-1.39	96	16.5	-0.1	131	515	87	82
52	7.620	0.152	0.070	2.30	89	-0.69	103	16.3	-0.2	131	516	87	82
53	7.766	0.146	0.067	2.25	89	-1.81	101	16.1	-0.2	131	515	87	82
54	7.919	0.153	0.068	2.26	89	-1.11	105	15.8	-0.3	130	515	87	82
55	8.064	0.145	0.063	2.23	89	-1.5	103	15.7	-0.1	130	514	86	83
56	8.216	0.152	0.066	2.21	90	-3.04	105	15.6	-0.1	130	517	86	82
57	8.361	0.145	0.065	2.17	89	-2.08	101	15.4	-0.2	130	518	86	83
58	8.510	0.149	0.077	2.11	90	-0.94	96	15.2	-0.2	130	517	86	82
59	8.656	0.146	0.064	2.51	89	-0.08	103	15.0	-0.2	131	518	82	82
60	8.813	0.157	0.070	2.28	90	-1.94	106	14.9	-0.1	130	519	86	82
61	8.961	0.148	0.065	2.28	89	-1.52	104	14.6	-0.3	131	520	86	82
62	9.111	0.150	0.076	2.27	90	-2.02	97	14.5	-0.1	130	520	86	82
63	9.260	0.149	0.071	2.27	90	-0.13	100	14.4	-0.1	131	519	86	82
64	9.410	0.150	0.064	2.26	90	-0.46	106	14.2	-0.2	131	520	87	82
65	9.560	0.150	0.067	2.26	90	-1.16	103	14.0	-0.2	130	520	86	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4
Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.710	0.150	0.066	2.25	90	-2.06	104	13.8	-0.2	130	520	86	83
67	9.861	0.151	0.067	2.24	90	-1.32	104	13.7	-0.1	131	521	86	82
68	10.009	0.148	0.070	2.22	90	-1.03	100	13.5	-0.2	129	521	87	82
69	10.161	0.152	0.079	2.28	90	-2.15	97	13.3	-0.2	133	521	86	83
70	10.307	0.146	0.079	2.26	90	-0.76	92	13.1	-0.2	130	521	86	82
71	10.461	0.154	0.067	2.26	90	-1.61	106	13.0	-0.1	130	521	86	82
72	10.607	0.146	0.071	2.26	90	-2.04	98	12.7	-0.3	130	521	86	83
73	10.761	0.154	0.069	2.25	90	-0.22	104	12.6	-0.1	131	523	87	83
74	10.909	0.148	0.064	2.25	90	-2.46	104	12.5	-0.1	130	522	86	83
75	11.061	0.152	0.070	2.23	90	-0.07	102	12.3	-0.2	130	521	86	83
76	11.209	0.148	0.067	2.28	90	-2.54	102	12.0	-0.3	130	522	86	82
77	11.360	0.151	0.063	2.28	90	-0.1	107	12.0	0	129	522	85	82
78	11.509	0.149	0.071	2.26	91	-0.8	99	11.8	-0.2	129	523	86	82
79	11.659	0.150	0.065	2.26	91	-1.58	105	11.6	-0.2	131	522	85	82
80	11.812	0.153	0.067	2.28	91	-0.22	105	11.5	-0.1	129	522	85	82
81	11.962	0.150	0.068	2.28	90	-2.26	102	11.3	-0.2	130	523	85	82
82	12.115	0.153	0.063	2.29	91	-2.43	108	11.2	-0.1	130	524	85	82
83	12.262	0.147	0.069	2.27	90	-2.32	100	11.0	-0.2	129	524	85	82
84	12.415	0.153	0.062	2.27	91	-0.45	109	10.9	-0.1	130	525	86	82
85	12.563	0.148	0.067	2.26	90	-2.35	102	10.7	-0.2	130	525	85	82
86	12.716	0.153	0.065	2.27	91	-0.48	107	10.6	-0.1	130	526	86	82
87	12.864	0.148	0.075	2.26	91	-0.5	96	10.4	-0.2	129	526	84	83
88	13.017	0.153	0.059	2.24	91	-2.18	112	10.3	-0.1	131	527	85	83
89	13.164	0.147	0.070	2.25	91	-0.46	99	10.1	-0.2	130	527	85	82
90	13.316	0.152	0.071	2.22	91	-2.04	101	9.9	-0.2	130	528	87	84
91	13.464	0.148	0.069	2.24	91	-1.97	100	9.8	-0.1	129	529	86	84
92	13.614	0.150	0.067	2.23	91	-2.72	103	9.5	-0.3	130	530	87	83
93	13.766	0.152	0.076	2.28	91	-2.76	98	9.5	0	130	531	86	83
94	13.916	0.150	0.068	2.28	91	-0.33	102	9.2	-0.3	130	534	87	82
95	14.069	0.153	0.064	2.27	90	-0.97	108	9.2	0	130	536	87	83
96	14.216	0.147	0.067	2.27	91	-1.38	101	9.0	-0.2	132	537	87	84
97	14.370	0.154	0.072	2.29	91	-0.77	102	8.8	-0.2	131	534	87	83
98	14.518	0.148	0.072	2.26	91	-0.87	98	8.6	-0.2	131	527	87	83

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.673	0.155	0.069	2.27	91	-2.14	105	8.5	-0.1	128	520	87	83
100	14.821	0.148	0.072	2.27	91	-2.82	98	8.4	-0.1	129	517	87	85
101	14.974	0.153	0.072	2.28	91	-2.89	101	8.3	-0.1	130	511	87	82
102	15.123	0.149	0.071	2.29	91	-2.13	99	8.2	-0.1	129	506	87	83
103	15.275	0.152	0.069	2.28	91	-2.88	103	8.1	-0.1	128	500	86	83
104	15.427	0.152	0.059	2.27	91	-0.46	111	8.0	-0.1	128	493	86	82
105	15.577	0.150	0.084	2.27	91	-0.52	92	7.8	-0.2	127	489	86	82
106	15.730	0.153	0.075	2.28	92	-2.06	99	7.9	0.1	126	487	86	82
107	15.878	0.148	0.078	2.26	91	-0.35	94	7.7	-0.2	127	488	86	83
108	16.031	0.153	0.071	2.25	91	-0.33	102	7.6	-0.1	127	489	86	82
109	16.179	0.148	0.064	2.26	92	-1.23	103	7.4	-0.2	126	486	86	82
110	16.334	0.155	0.068	2.26	91	-0.41	105	7.4	0	125	479	86	82
111	16.482	0.148	0.066	2.27	92	-2.8	102	7.3	-0.1	124	470	86	82
112	16.635	0.153	0.070	2.27	91	-1.54	102	7.2	-0.1	125	464	85	82
113	16.784	0.149	0.065	2.25	92	-1.12	103	7.1	-0.1	123	458	85	83
114	16.936	0.152	0.069	2.27	92	-1.74	102	7.1	0	122	451	85	85
115	17.087	0.151	0.062	2.26	92	-2.93	107	7.0	-0.1	122	446	85	82
116	17.238	0.151	0.072	2.27	92	-0.84	99	6.8	-0.2	122	440	85	83
117	17.391	0.153	0.071	2.26	92	-2.69	101	6.8	0	121	435	85	83
118	17.539	0.148	0.062	2.27	92	-1.12	105	6.8	0	122	432	85	82
119	17.692	0.153	0.066	2.28	92	-2.3	105	6.7	-0.1	119	426	87	82
120	17.840	0.148	0.067	2.24	92	-2.46	100	6.7	0	119	422	86	82
121	17.995	0.155	0.066	2.26	92	-0.35	106	6.5	-0.2	118	420	86	82
122	18.143	0.148	0.065	2.26	92	-2.78	102	6.4	-0.1	118	416	86	82
123	18.297	0.154	0.070	2.27	92	-1.58	102	6.5	0.1	117	412	86	83
124	18.445	0.148	0.067	2.25	92	-2.87	100	6.5	0	117	409	86	83
125	18.597	0.152	0.067	2.28	92	-2.68	103	6.4	-0.1	118	408	86	82
126	18.749	0.152	0.067	2.25	92	-0.55	103	6.1	-0.3	117	405	87	82
127	18.899	0.150	0.072	2.26	92	-0.59	98	6.3	0.2	117	405	86	82
128	19.052	0.153	0.073	2.27	92	-0.87	99	6.1	-0.2	116	404	87	82
129	19.200	0.148	0.069	2.28	92	-2.91	99	6.2	0.1	115	404	87	82
130	19.354	0.154	0.081	2.26	92	-3.01	95	6.1	-0.1	116	403	87	83
131	19.501	0.147	0.073	2.27	92	-0.54	95	6.0	-0.1	116	402	86	83

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4
Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	19.656	0.155	0.078	2.25	92	-2.82	97	6.0	0	115	398	86	82
133	19.805	0.149	0.072	2.24	92	-2.73	97	5.9	-0.1	114	395	87	82
134	19.958	0.153	0.079	2.25	92	-1.94	95	5.9	0	114	391	85	82
135	20.106	0.148	0.056	2.25	92	-2.61	109	5.8	-0.1	113	386	85	82
136	20.259	0.153	0.067	2.27	92	-2.78	103	5.8	0	113	382	85	82
137	20.410	0.151	0.066	2.26	92	-2.83	103	5.8	0	113	379	85	83
138	20.561	0.151	0.063	2.26	92	-2.72	105	5.7	-0.1	112	376	85	82
139	20.714	0.153	0.072	2.26	92	-1.9	100	5.7	0	112	372	85	81
140	20.862	0.148	0.069	2.27	92	-2.73	98	5.6	-0.1	112	370	85	82
141	21.015	0.153	0.072	2.27	92	-1.05	100	5.7	0.1	112	368	85	82
142	21.164	0.149	0.064	2.26	92	-1.45	103	5.5	-0.2	111	365	86	82
143	21.318	0.154	0.075	2.26	92	-0.5	98	5.5	0	111	361	86	82
144	21.467	0.149	0.070	2.25	92	-0.64	98	5.4	-0.1	110	360	86	81
145	21.620	0.153	0.066	2.26	92	-1.28	104	5.4	0	110	358	87	82
146	21.769	0.149	0.064	2.27	92	-0.41	103	5.4	0	110	356	86	83
147	21.920	0.151	0.067	2.25	92	-0.95	102	5.3	-0.1	109	352	86	82
148	22.072	0.152	0.063	2.24	92	-0.6	105	5.4	0.1	109	349	86	82
149	22.223	0.151	0.068	2.26	92	-0.95	101	5.3	-0.1	109	343	86	83
150	22.376	0.153	0.066	2.27	92	-0.45	104	5.3	0	109	339	86	82
151	22.523	0.147	0.067	2.28	92	-2.38	99	5.2	-0.1	108	335	86	82
152	22.677	0.154	0.071	2.29	92	-0.52	101	5.2	0	107	332	85	82
153	22.825	0.148	0.068	2.27	92	-0.69	99	5.2	0	109	331	85	82
154	22.980	0.155	0.071	2.25	92	-2.93	101	5.1	-0.1	107	327	85	81
155	23.129	0.149	0.066	2.27	92	-0.56	101	5.1	0	107	325	85	82
156	23.282	0.153	0.065	2.28	92	-0.89	104	5.1	0	106	323	86	82
157	23.431	0.149	0.071	2.26	92	-1.53	97	5.1	0	106	320	85	81
158	23.582	0.151	0.065	2.29	92	-1.46	103	5.0	-0.1	107	316	85	81
159	23.734	0.152	0.061	2.26	92	-0.48	107	5.0	0	105	314	85	82
160	23.885	0.151	0.071	2.25	92	-2.86	98	5.0	0	105	313	85	82
161	24.038	0.153	0.071	2.27	92	-2.64	100	5.0	0	106	311	85	81
162	24.185	0.147	0.069	2.26	92	-2.3	97	4.9	-0.1	104	308	85	81
163	24.339	0.154	0.064	2.26	92	-1.35	106	4.9	0	104	307	86	81
164	24.487	0.148	0.067	2.24	92	-2.75	99	4.9	0	103	305	86	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	24.642	0.155	0.074	2.27	92	-2.88	99	4.9	0	104	303	86	81
166	24.791	0.149	0.076	2.23	92	-2.22	94	4.9	0	104	302	86	81
167	24.944	0.153	0.064	2.27	92	-0.93	105	4.9	0	103	299	86	82
168	25.093	0.149	0.069	2.27	92	-0.41	98	4.8	-0.1	103	299	86	81
169	25.245	0.152	0.068	2.26	92	-2.91	101	4.8	0	103	298	86	81
170	25.397	0.152	0.067	2.26	92	-2.31	102	4.8	0	102	296	87	81
171	25.547	0.150	0.066	2.27	92	-2.84	101	4.8	0	102	294	85	81
172	25.700	0.153	0.069	2.25	92	-0.61	101	4.7	-0.1	102	293	85	81
173	25.848	0.148	0.074	2.25	92	-0.94	94	4.7	0	102	293	86	81
174	26.002	0.154	0.068	2.27	92	-2.97	102	4.6	-0.1	102	293	85	81
175	26.151	0.149	0.061	2.28	92	-1.17	104	4.7	0.1	101	291	85	81
176	26.305	0.154	0.069	2.25	92	-2.39	101	4.7	0	101	290	85	81
177	26.454	0.149	0.068	2.27	92	-2.5	99	4.7	0	101	289	84	81
178	26.606	0.152	0.072	2.27	92	-2.82	98	4.6	-0.1	101	289	85	81
179	26.756	0.150	0.070	2.25	92	-0.5	98	4.6	0	102	288	85	81
180	26.908	0.152	0.068	2.27	92	-0.36	101	4.6	0	101	287	85	81
181	27.060	0.152	0.071	2.27	92	-2.86	99	4.6	0	101	286	85	81
182	27.211	0.151	0.071	2.25	92	-0.43	98	4.5	-0.1	100	286	86	81
183	27.363	0.152	0.074	2.27	92	-0.61	97	4.5	0	100	283	86	81
184	27.511	0.148	0.066	2.28	92	-2.85	100	4.5	0	100	284	86	81
185	27.665	0.154	0.068	2.26	92	-0.4	102	4.5	0	101	281	86	81
186	27.815	0.150	0.071	2.25	92	-1.18	97	4.5	0	102	280	86	81
187	27.969	0.154	0.065	2.25	92	-2	104	4.4	-0.1	101	282	86	81
188	28.117	0.148	0.074	2.29	92	-1.06	94	4.3	-0.1	102	279	86	81
189	28.270	0.153	0.071	2.27	92	-1.3	99	4.4	0.1	102	279	86	82
190	28.420	0.150	0.067	2.26	92	-1.17	100	4.4	0	101	277	85	82
191	28.572	0.152	0.076	2.25	92	-1.45	95	4.4	0	100	276	85	81
192	28.724	0.152	0.074	2.25	92	-1.46	97	4.4	0	100	276	85	81
193	28.874	0.150	0.065	2.26	92	-2.48	102	4.3	-0.1	100	275	85	80
194	29.027	0.153	0.066	2.25	92	-2.96	103	4.3	0	100	274	85	81
195	29.175	0.148	0.072	2.27	92	-2.97	95	4.3	0	100	274	85	81
196	29.330	0.155	0.076	2.27	92	-0.5	97	4.3	0	100	274	85	81
197	29.478	0.148	0.059	2.26	92	-2.8	105	4.2	-0.1	99	272	85	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	4	Technician:	ADK
		Date:	4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	29.633	0.155	0.067	2.25	92	-1.07	103	4.3	0.1	99	272	85	82
199	29.780	0.147	0.065	2.26	92	-0.43	100	4.3	0	99	272	86	81
200	29.933	0.153	0.066	2.28	92	-1.21	103	4.3	0	99	271	86	81
201	30.084	0.151	0.073	2.25	92	-1.04	97	4.2	-0.1	100	271	86	80
202	30.235	0.151	0.067	2.26	92	-2.72	101	4.2	0	100	270	87	81
203	30.388	0.153	0.074	2.26	92	-0.81	97	4.2	0	100	270	86	80
204	30.537	0.149	0.071	2.27	92	-2.18	97	4.2	0	99	268	86	81
205	30.690	0.153	0.067	2.27	92	-0.42	102	4.1	-0.1	100	268	87	81
206	30.838	0.148	0.066	2.26	92	-2.87	99	4.1	0	99	269	86	80
207	30.993	0.155	0.065	2.29	92	-1.53	105	4.1	0	100	268	86	80
208	31.141	0.148	0.068	2.26	92	-0.8	98	4.1	0	99	266	86	80
209	31.294	0.153	0.066	2.26	91	-0.44	103	4.1	0	100	266	85	81
210	31.443	0.149	0.069	2.26	92	-0.44	98	4.1	0	98	265	85	80
211	31.595	0.152	0.066	2.26	92	-2.89	102	4.0	-0.1	99	266	85	80
212	31.747	0.152	0.070	2.26	92	-0.49	99	4.0	0	99	265	85	80
213	31.898	0.151	0.068	2.28	92	-1.6	100	4.0	0	99	265	85	81
214	32.051	0.153	0.067	2.26	92	-0.7	102	4.0	0	98	265	85	80
215	32.199	0.148	0.061	2.25	92	-0.86	103	4.0	0	98	264	85	80
216	32.352	0.153	0.066	2.25	92	-2.8	103	3.9	-0.1	98	263	85	80
217	32.501	0.149	0.063	2.24	92	-0.62	102	4.0	0.1	98	262	86	81
218	32.656	0.155	0.075	2.26	92	-2	98	3.8	-0.2	98	262	86	80
219	32.804	0.148	0.071	2.24	92	-2.13	96	3.9	0.1	99	262	86	80
220	32.957	0.153	0.072	2.27	92	-0.37	98	3.9	0	98	260	86	81
221	33.106	0.149	0.065	2.27	92	-1.09	101	3.9	0	99	260	86	82
222	33.257	0.151	0.068	2.26	92	-0.48	100	3.9	0	98	260	86	82
223	33.410	0.153	0.069	2.27	92	-0.59	100	3.9	0	98	260	86	81
224	33.560	0.150	0.066	2.25	92	-2.2	101	3.8	-0.1	99	260	85	80
225	33.713	0.153	0.067	2.27	92	-0.42	102	3.8	0	98	259	86	80
226	33.861	0.148	0.068	2.24	92	-2.8	98	3.8	0	99	260	85	80
227	34.015	0.154	0.064	2.27	92	-2.32	105	3.8	0	98	259	85	81
228	34.164	0.149	0.073	2.27	92	-0.57	95	3.8	0	97	258	85	81
229	34.318	0.154	0.069	2.27	92	-2.46	101	3.7	-0.1	97	258	86	81
230	34.467	0.149	0.067	2.26	92	-1.18	99	3.7	0	97	258	84	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	34.619	0.152	0.066	2.27	92	-1.8	102	3.7	0	98	257	85	81
232	34.769	0.150	0.069	2.28	92	-2.89	98	3.7	0	97	257	85	81
233	34.920	0.151	0.067	2.25	92	-0.51	101	3.7	0	98	256	85	81
234	35.073	0.153	0.068	2.25	92	-0.41	101	3.6	-0.1	98	257	86	81
235	35.223	0.150	0.062	2.25	92	-2.26	104	3.7	0.1	98	256	86	81
236	35.376	0.153	0.072	2.25	92	-1.21	98	3.6	-0.1	98	255	86	81
237	35.524	0.148	0.063	2.27	92	-1	102	3.6	0	98	254	86	81
238	35.677	0.153	0.067	2.27	92	-1.49	102	3.6	0	98	254	86	80
239	35.826	0.149	0.067	2.26	92	-2.83	99	3.5	-0.1	98	254	86	81
240	35.980	0.154	0.067	2.27	92	-0.51	103	3.5	0	97	253	87	80
241	36.129	0.149	0.067	2.27	92	-1.8	99	3.6	0.1	97	253	86	80
242	36.281	0.152	0.068	2.26	92	-2.73	100	3.6	0	97	252	87	80
243	36.431	0.150	0.067	2.27	92	-1.42	100	3.5	-0.1	97	251	85	82
244	36.583	0.152	0.069	2.25	92	-0.65	100	3.5	0	96	251	85	80
245	36.735	0.152	0.063	2.27	92	-2.92	104	3.5	0	97	251	85	80
246	36.885	0.150	0.074	2.24	92	-1.51	95	3.5	0	97	252	86	80
247	37.037	0.152	0.072	2.25	92	-2.23	98	3.5	0	97	251	84	81
248	37.186	0.149	0.074	2.26	92	-1.69	94	3.4	-0.1	96	251	84	80
249	37.339	0.153	0.065	2.27	92	-1.95	104	3.4	0	98	250	85	80
250	37.488	0.149	0.067	2.24	92	-2.03	99	3.4	0	97	249	85	80
251	37.642	0.154	0.066	2.25	92	-0.46	103	3.4	0	97	251	85	80
252	37.791	0.149	0.072	2.26	92	-0.65	96	3.4	0	97	250	86	80
253	37.943	0.152	0.070	2.27	92	-2.77	99	3.4	0	97	250	85	80
254	38.092	0.149	0.073	2.25	92	-1.76	95	3.2	-0.2	97	250	86	80
255	38.244	0.152	0.077	2.25	92	-0.77	94	3.3	0.1	98	250	85	80
256	38.397	0.153	0.070	2.26	92	-0.87	100	3.3	0	97	250	86	81
257	38.546	0.149	0.067	2.24	92	-2.93	99	3.4	0.1	97	250	86	80
258	38.699	0.153	0.071	2.27	92	-2.84	99	3.3	-0.1	97	249	87	80
259	38.847	0.148	0.073	2.26	92	-1.5	94	3.3	0	97	248	86	80
260	39.000	0.153	0.067	2.26	92	-2.95	102	3.2	-0.1	96	248	85	80
261	39.149	0.149	0.070	2.26	92	-0.79	97	3.2	0	97	250	86	81
262	39.303	0.154	0.066	2.24	92	-0.61	103	3.2	0	97	249	85	80
263	39.452	0.149	0.076	2.24	92	-0.42	93	3.2	0	97	248	85	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4
Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	39.604	0.152	0.071	2.28	92	-0.48	98	3.1	-0.1	97	248	84	80
265	39.754	0.150	0.082	2.27	92	-0.66	90	3.3	0.2	96	248	85	81
266	39.905	0.151	0.063	2.25	92	-1.47	104	3.2	-0.1	97	248	85	80
267	40.058	0.153	0.066	2.25	92	-0.89	103	3.0	-0.2	97	247	85	81
268	40.207	0.149	0.071	2.23	92	-0.55	96	3.0	0	97	247	85	80
269	40.360	0.153	0.067	2.26	92	-1.06	102	3.1	0.1	97	246	85	80
270	40.508	0.148	0.067	2.28	92	-2.67	98	3.1	0	96	246	85	80
271	40.662	0.154	0.068	2.27	92	-1.2	102	3.1	0	96	247	85	80
272	40.810	0.148	0.066	2.26	92	-1.43	99	3.0	-0.1	96	247	85	82
273	40.965	0.155	0.071	2.25	92	-1.87	100	3.0	0	96	247	85	80
274	41.113	0.148	0.064	2.27	92	-0.96	101	3.0	0	96	247	85	80
275	41.265	0.152	0.073	2.26	92	-1.09	97	3.0	0	97	246	85	81
276	41.415	0.150	0.068	2.27	92	-2.99	99	2.9	-0.1	98	246	85	80
277	41.567	0.152	0.062	2.25	91	-0.46	105	3.0	0.1	97	246	85	81
278	41.719	0.152	0.067	2.25	92	-2.88	101	2.9	-0.1	96	246	84	80
279	41.869	0.150	0.066	2.22	92	-2.85	101	2.8	-0.1	97	246	85	80
280	42.021	0.152	0.074	2.26	92	-0.39	96	2.9	0.1	97	246	85	80
281	42.169	0.148	0.069	2.28	92	-0.56	97	2.9	0	97	246	85	80
282	42.322	0.153	0.065	2.25	92	-1.37	103	2.9	0	96	246	85	80
283	42.471	0.149	0.069	2.27	92	-2.92	98	2.9	0	97	245	85	80
284	42.625	0.154	0.068	2.26	92	-2.82	102	3.0	0.1	97	245	86	80
285	42.774	0.149	0.066	2.26	92	-0.88	100	2.8	-0.2	97	245	86	80
286	42.926	0.152	0.072	2.26	92	-1.22	98	2.7	-0.1	96	246	86	80
287	43.075	0.149	0.070	2.25	92	-2.39	97	2.8	0.1	96	244	85	80
288	43.227	0.152	0.068	2.25	91	-2.76	101	2.8	0	97	244	85	80
289	43.378	0.151	0.064	2.25	92	-1.89	103	2.8	0	97	243	85	80
290	43.529	0.151	0.065	2.25	92	-2.57	102	2.8	0	97	243	85	80
291	43.682	0.153	0.064	2.25	91	-1.24	105	2.7	-0.1	98	243	86	81
292	43.829	0.147	0.072	2.26	92	-2.73	94	2.7	0	97	244	85	80
293	43.982	0.153	0.068	2.25	92	-2.3	101	2.7	0	97	243	85	80
294	44.131	0.149	0.072	2.25	92	-2.06	96	2.7	0	96	243	85	80
295	44.285	0.154	0.071	2.24	92	-2.91	99	2.7	0	95	243	85	80
296	44.434	0.149	0.068	2.24	92	-2.35	98	2.6	-0.1	96	241	85	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4
Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	44.586	0.152	0.067	2.28	92	-2.64	101	2.6	0	96	241	85	81
298	44.736	0.150	0.075	2.27	92	-0.49	94	2.6	0	96	241	85	80
299	44.887	0.151	0.072	2.26	92	-0.33	97	2.6	0	96	242	86	80
300	45.039	0.152	0.074	2.25	92	-1.3	96	2.6	0	96	240	86	80
301	45.189	0.150	0.070	2.24	92	-2.53	98	2.6	0	95	240	86	80
302	45.342	0.153	0.069	2.27	92	-1.02	100	2.6	0	95	239	86	81
303	45.490	0.148	0.067	2.25	92	-0.5	99	2.6	0	97	239	86	80
304	45.643	0.153	0.077	2.23	91	-1.55	95	2.6	0	96	239	85	81
305	45.791	0.148	0.069	2.24	91	-0.45	97	2.5	-0.1	95	239	85	80
306	45.946	0.155	0.070	2.25	92	-0.47	101	2.5	0	96	238	85	80
307	46.094	0.148	0.069	2.26	91	-2.89	97	2.5	0	97	238	85	80
308	46.247	0.153	0.068	2.24	92	-2.85	101	2.5	0	97	239	85	80
309	46.396	0.149	0.067	2.26	91	-2.23	99	2.5	0	96	239	85	80
310	46.548	0.152	0.072	2.27	92	-0.42	97	2.4	-0.1	95	239	85	80
311	46.699	0.151	0.068	2.25	92	-2.51	100	2.4	0	95	237	86	80
312	46.850	0.151	0.067	2.23	92	-2.6	100	2.4	0	95	237	86	80
313	47.003	0.153	0.066	2.24	92	-2.45	103	2.4	0	96	237	85	80
314	47.151	0.148	0.073	2.24	92	-2.6	94	2.3	-0.1	95	236	86	80
315	47.304	0.153	0.066	2.26	91	-0.49	103	2.5	0.2	95	237	85	80
316	47.452	0.148	0.064	2.24	92	-0.68	101	2.4	-0.1	96	236	86	80
317	47.607	0.155	0.069	2.25	92	-0.46	102	2.3	-0.1	95	236	85	80
318	47.755	0.148	0.067	2.25	92	-2.95	98	2.4	0.1	95	236	86	80
319	47.908	0.153	0.069	2.25	91	-0.48	100	2.2	-0.2	95	235	85	80
320	48.057	0.149	0.066	2.23	92	-2.74	100	2.3	0.1	96	235	85	80
321	48.209	0.152	0.075	2.25	91	-1.69	96	2.3	0	96	235	85	80
322	48.360	0.151	0.064	2.23	91	-2.73	103	2.3	0	96	234	85	80
323	48.511	0.151	0.066	2.25	92	-2.87	101	2.3	0	95	234	85	81
324	48.664	0.153	0.070	2.24	91	-2.19	100	2.2	-0.1	96	235	84	79
325	48.812	0.148	0.066	2.26	92	-2.91	99	2.2	0	95	233	84	80
326	48.965	0.153	0.072	2.24	92	-0.33	98	2.2	0	94	233	85	81
327	49.113	0.148	0.066	2.26	91	-2.41	99	2.2	0	95	233	85	80
328	49.267	0.154	0.066	2.25	91	-0.56	103	2.1	-0.1	95	233	86	80
329	49.416	0.149	0.072	2.24	91	-0.96	96	2.2	0.1	96	232	85	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	49.569	0.153	0.069	2.25	91	-0.54	100	2.2	0	95	232	85	81
331	49.718	0.149	0.069	2.24	92	-2.95	98	2.2	0	95	232	86	80
332	49.870	0.152	0.067	2.24	91	-0.84	101	2.1	-0.1	95	231	85	80
333	50.021	0.151	0.066	2.24	91	-0.55	101	2.1	0	96	231	86	79
334	50.172	0.151	0.067	2.26	92	-1.71	100	2.0	-0.1	95	231	85	80
335	50.325	0.153	0.073	2.25	92	-0.76	97	2.1	0.1	95	231	85	80
336	50.473	0.148	0.065	2.27	91	-0.59	100	2.1	0	95	231	86	80
337	50.627	0.154	0.070	2.26	92	-1.31	100	2.1	0	96	230	85	79
338	50.774	0.147	0.072	2.24	91	-1.68	94	2.1	0	95	230	85	79
339	50.929	0.155	0.068	2.21	91	-2.55	102	2.2	0.1	95	230	85	80
340	51.078	0.149	0.072	2.23	91	-0.57	96	2.0	-0.2	95	230	84	80
341	51.231	0.153	0.069	2.26	91	-2.87	100	2.0	0	94	229	85	80
342	51.379	0.148	0.069	2.24	91	-0.58	97	2.0	0	94	229	85	80
343	51.531	0.152	0.074	2.25	91	-0.64	96	2.0	0	94	229	85	80
344	51.683	0.152	0.063	2.25	92	-2.94	104	2.0	0	94	229	85	80
345	51.833	0.150	0.064	2.25	92	-2.64	102	2.0	0	94	230	86	80
346	51.986	0.153	0.071	2.23	91	-2.91	99	2.0	0	95	230	85	80
347	52.134	0.148	0.067	2.24	92	-2.86	98	2.0	0	95	228	86	80
348	52.288	0.154	0.076	2.26	92	-2.5	96	1.9	-0.1	94	229	85	80
349	52.435	0.147	0.068	2.26	92	-1.51	97	1.9	0	94	228	86	81
350	52.590	0.155	0.075	2.26	92	-2.77	97	2.0	0.1	96	229	85	80
351	52.738	0.148	0.068	2.25	92	-2.73	98	1.9	-0.1	95	228	86	80
352	52.892	0.154	0.069	2.25	91	-1.85	101	1.9	0	95	227	85	81
353	53.040	0.148	0.061	2.27	91	-0.46	103	1.8	-0.1	95	228	85	80
354	53.192	0.152	0.068	2.25	92	-0.31	100	1.9	0.1	95	227	85	81
355	53.342	0.150	0.075	2.25	92	-0.35	94	1.8	-0.1	94	228	84	81
356	53.494	0.152	0.074	2.23	91	-0.5	96	1.8	0	95	227	84	81
357	53.646	0.152	0.069	2.25	92	-1.94	99	1.8	0	94	226	84	81
358	53.795	0.149	0.072	2.26	92	-2.75	95	1.8	0	94	226	85	80
359	53.948	0.153	0.066	2.27	92	-2.93	102	1.8	0	95	227	85	80
360	54.095	0.147	0.067	2.23	91	-0.4	98	1.8	0	94	227	86	80
361	54.250	0.155	0.075	2.24	91	-0.97	97	1.8	0	94	227	85	80
362	54.398	0.148	0.063	2.24	92	-1.59	101	1.7	-0.1	94	226	85	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4
Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363	54.552	0.154	0.073	2.24	92	-1.54	98	1.6	-0.1	94	226	86	80
364	54.700	0.148	0.076	2.25	92	-0.45	92	1.7	0.1	95	227	86	80
365	54.852	0.152	0.067	2.28	92	-2.55	101	1.7	0	94	226	86	81
366	55.002	0.150	0.067	2.25	91	-1.66	100	1.7	0	94	225	86	80
367	55.154	0.152	0.068	2.27	92	-2.79	100	1.7	0	95	226	85	80
368	55.306	0.152	0.072	2.24	92	-0.5	97	1.6	-0.1	94	226	86	80
369	55.455	0.149	0.070	2.23	91	-2.81	97	1.7	0.1	94	225	85	80
370	55.607	0.152	0.071	2.24	92	-2.27	98	1.6	-0.1	95	225	85	80
371	55.756	0.149	0.071	2.24	92	-0.36	96	1.6	0	94	225	85	80
372	55.909	0.153	0.064	2.25	91	-0.51	104	1.6	0	94	224	85	80
373	56.058	0.149	0.069	2.25	91	-2.44	98	1.6	0	94	224	86	81
374	56.212	0.154	0.068	2.24	91	-2.89	102	1.6	0	94	223	85	80
375	56.360	0.148	0.074	2.25	92	-1.98	94	1.6	0	94	224	85	80
376	56.512	0.152	0.065	2.25	91	-0.77	103	1.6	0	94	223	85	80
377	56.661	0.149	0.063	2.24	92	-0.57	102	1.6	0	95	223	86	80
378	56.813	0.152	0.071	2.24	91	-2.36	98	1.5	-0.1	94	223	86	80
379	56.966	0.153	0.069	2.24	92	-1.82	100	1.5	0	94	222	86	80
380	57.115	0.149	0.073	2.25	92	-1.09	95	1.5	0	94	223	86	80
381	57.267	0.152	0.064	2.26	91	-1.43	103	1.5	0	94	223	85	80
382	57.416	0.149	0.077	2.26	92	-0.72	92	1.5	0	94	223	85	80
383	57.569	0.153	0.071	2.26	91	-1.56	99	1.5	0	94	222	85	80
384	57.717	0.148	0.068	2.24	91	-0.79	98	1.5	0	93	222	85	81
385	57.871	0.154	0.068	2.25	91	-2.4	102	1.4	-0.1	93	221	85	80
386	58.020	0.149	0.070	2.25	91	-1.02	97	1.4	0	93	221	84	80
387	58.172	0.152	0.072	2.27	92	-2.72	97	1.4	0	94	221	84	80
388	58.321	0.149	0.068	2.25	91	-2.85	98	1.4	0	94	220	85	80
389	58.473	0.152	0.069	2.24	92	-0.48	100	1.4	0	95	220	85	81
390	58.625	0.152	0.071	2.26	92	-0.48	98	1.4	0	94	220	85	80
391	58.775	0.150	0.066	2.25	92	-0.49	100	1.3	-0.1	95	221	85	79
392	58.927	0.152	0.073	2.27	92	-0.71	97	1.2	-0.1	94	222	85	80
393	59.075	0.148	0.077	2.23	92	-0.93	92	1.4	0.2	94	221	86	79
394	59.228	0.153	0.072	2.25	91	-1.17	98	1.3	-0.1	93	221	86	80
395	59.377	0.149	0.063	2.25	91	-1.87	102	1.3	0	93	220	85	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396	59.531	0.154	0.079	2.24	92	-0.46	94	1.2	-0.1	93	220	85	79
397	59.680	0.149	0.069	2.23	91	-1.39	98	1.3	0.1	93	219	85	80
398	59.832	0.152	0.069	2.25	91	-2.95	100	1.3	0	93	219	85	80
399	59.981	0.149	0.069	2.27	91	-2.87	98	1.3	0	94	219	85	79
400	60.132	0.151	0.064	2.25	91	-2.82	103	1.3	0	95	219	85	80
401	60.284	0.152	0.067	2.24	91	-0.61	101	1.2	-0.1	98	234	85	79
402	60.434	0.150	0.072	2.24	91	-2.93	96	1.2	0	95	231	85	80
403	60.587	0.153	0.070	2.25	91	-0.77	100	1.2	0	95	229	85	80
404	60.735	0.148	0.068	2.26	91	-1.94	98	1.1	-0.1	94	229	85	80
405	60.888	0.153	0.064	2.23	92	-0.31	104	1.1	0	94	230	86	81
406	61.035	0.147	0.072	2.25	91	-0.55	94	1.1	0	95	232	86	79
407	61.190	0.155	0.068	2.24	91	-2.9	102	1.1	0	94	232	86	80
408	61.338	0.148	0.065	2.25	91	-1.64	100	1.1	0	95	234	85	79
409	61.492	0.154	0.067	2.24	91	-2.85	103	1.0	-0.1	95	232	86	79
410	61.639	0.147	0.065	2.26	92	-2.77	99	1.0	0	94	234	85	80
411	61.791	0.152	0.078	2.26	91	-2.72	94	1.0	0	95	234	86	80
412	61.942	0.151	0.068	2.24	91	-2.8	100	1.0	0	94	234	84	80
413	62.093	0.151	0.068	2.24	91	-0.43	100	1.0	0	95	235	84	79
414	62.245	0.152	0.065	2.25	91	-2.76	103	1.0	0	95	236	85	81
415	62.394	0.149	0.068	2.25	91	-2.74	98	1.0	0	95	236	85	80
416	62.546	0.152	0.069	2.24	92	-2.84	100	0.9	-0.1	95	237	85	80
417	62.694	0.148	0.071	2.24	91	-0.99	96	0.9	0	95	239	85	79
418	62.848	0.154	0.068	2.24	91	-1.07	102	0.9	0	95	240	85	80
419	62.997	0.149	0.073	2.24	91	-0.47	95	0.9	0	96	242	85	80
420	63.150	0.153	0.063	2.25	91	-0.47	105	0.9	0	95	243	86	80
421	63.299	0.149	0.065	2.24	91	-1.61	101	0.8	-0.1	95	244	85	80
422	63.450	0.151	0.071	2.23	91	-0.99	98	0.8	0	95	245	86	79
423	63.600	0.150	0.073	2.24	92	-2.86	96	0.8	0	95	246	85	80
424	63.752	0.152	0.065	2.24	91	-2.83	103	0.8	0	95	246	85	80
425	63.903	0.151	0.067	2.23	91	-2.82	101	0.8	0	96	245	85	80
426	64.053	0.150	0.067	2.21	91	-2.6	100	0.8	0	96	245	85	80
427	64.205	0.152	0.070	2.25	91	-2.39	99	0.7	-0.1	96	246	85	80
428	64.353	0.148	0.065	2.25	91	-0.95	100	0.7	0	96	245	84	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
429	64.506	0.153	0.070	2.30	91	-2.48	100	0.7	0	96	245	85	79
430	64.656	0.150	0.069	2.27	91	-0.43	99	0.7	0	96	247	86	79
431	64.811	0.155	0.070	2.28	91	-0.9	101	0.6	-0.1	96	246	85	79
432	64.960	0.149	0.065	2.28	91	-1.87	101	0.7	0.1	95	245	85	79
433	65.114	0.154	0.069	2.27	91	-2.87	101	0.6	-0.1	95	244	85	80
434	65.265	0.151	0.070	2.27	91	-0.91	98	0.6	0	95	243	86	80
435	65.418	0.153	0.063	2.28	91	-1.32	105	0.6	0	95	243	85	80
436	65.571	0.153	0.070	2.30	91	-2.78	100	0.6	0	95	243	86	81
437	65.719	0.148	0.070	2.28	91	-0.74	96	0.6	0	95	242	85	80
438	65.874	0.155	0.071	2.28	91	-2.24	100	0.5	-0.1	96	242	85	80
439	66.024	0.150	0.062	2.29	91	-0.62	104	0.5	0	96	242	85	80
440	66.179	0.155	0.064	2.29	91	-2.97	106	0.5	0	95	243	84	80
441	66.328	0.149	0.069	2.27	91	-1.57	98	0.5	0	96	243	85	80
442	66.482	0.154	0.070	2.29	91	-0.75	100	0.5	0	96	242	85	80
443	66.632	0.150	0.075	2.27	91	-1.73	94	0.5	0	96	242	84	81
444	66.785	0.153	0.067	2.29	91	-0.45	102	0.4	-0.1	96	242	85	80
445	66.939	0.154	0.067	2.28	92	-3.01	103	0.4	0	97	242	85	81
446	67.087	0.148	0.075	2.29	92	-0.5	93	0.4	0	97	243	85	81
447	67.242	0.155	0.065	2.30	91	-2.95	105	0.3	-0.1	96	243	86	79
448	67.391	0.149	0.065	2.26	91	-2.57	101	0.4	0.1	96	243	86	80
449	67.546	0.155	0.072	2.26	91	-1.92	100	0.4	0	95	242	86	80
450	67.696	0.150	0.068	2.28	91	-0.37	99	0.4	0	96	241	86	80
451	67.849	0.153	0.072	2.31	91	-0.49	98	0.4	0	96	241	85	80
452	67.999	0.150	0.070	2.28	91	-2.61	98	0.3	-0.1	96	242	86	80
453	68.153	0.154	0.069	2.27	91	-1.68	101	0.3	0	96	242	86	80
454	68.306	0.153	0.069	2.26	91	-0.91	100	0.2	-0.1	96	243	86	80
455	68.455	0.149	0.069	2.28	91	-2.23	98	0.2	0	96	243	85	79
456	68.609	0.154	0.071	2.29	91	-1.43	100	0.3	0.1	96	242	85	80
457	68.759	0.150	0.067	2.31	91	-1.2	100	0.3	0	95	243	85	81
458	68.914	0.155	0.073	2.29	91	-0.74	99	0.2	-0.1	96	242	86	79
459	69.064	0.150	0.066	2.30	92	-1.59	100	0.2	0	95	241	85	80
460	69.217	0.153	0.070	2.29	91	-0.57	100	0.2	0	95	241	85	80
461	69.367	0.150	0.063	2.29	91	-0.71	103	0.2	0	95	241	85	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	4	Technician:	ADK
		Date:	4/11/2019

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
462	69.520	0.153	0.070	2.28	91	-0.51	100	0.2	0	97	241	86	79
463	69.674	0.154	0.068	2.28	91	-1.48	102	0.2	0	96	241	86	79
464	69.823	0.149	0.066	2.29	91	-1.83	100	0.2	0	95	240	86	80
465	69.977	0.154	0.067	2.29	91	-2.82	103	0.1	-0.1	95	239	86	80
466	70.127	0.150	0.068	2.28	91	-2.94	99	0.1	0	97	238	86	80
467	70.282	0.155	0.068	2.29	91	-0.45	103	0.1	0	96	238	86	79
468	70.432	0.150	0.070	2.29	91	-1.59	98	0.2	0.1	95	239	86	79
469	70.584	0.152	0.073	2.27	91	-2.4	97	0.1	-0.1	95	238	85	81
470	70.735	0.151	0.071	2.28	91	-2.98	98	0.1	0	95	238	85	80
471	70.888	0.153	0.067	2.29	91	-1.93	102	0.0	-0.1	95	237	85	80
Avg/Tot	70.888	0.151	0.069	2.25	91	-1.62	100			107	327	86	80.9

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	4	Technician:	ADK
		Date:	4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.002		0.00	83	-1		87	0.000	6.38	0.07
1	0.100	0.098	2.17	83	-0.74	66	87	-0.080	6.08	0.10
2	0.248	0.148	2.23	83	-0.66	105	88	-0.090	4.90	0.14
3	0.391	0.143	2.22	83	-1.12	105	89	-0.100	3.79	0.61
4	0.539	0.148	2.43	83	-2.98	109	89	-0.080	6.13	0.52
5	0.683	0.144	2.26	83	-1.48	100	86	-0.100	9.33	0.50
6	0.830	0.147	2.20	83	-2.06	105	87	-0.100	10.70	0.52
7	0.975	0.145	2.28	83	-3.7	108	87	-0.090	10.80	0.50
8	1.123	0.148	2.23	84	-3.04	102	86	-0.090	10.55	0.56
9	1.266	0.143	2.23	84	-1.51	98	88	-0.080	10.92	0.72
10	1.414	0.148	2.20	84	-3.74	111	89	-0.090	10.83	0.68
11	1.558	0.144	2.24	84	-1.77	103	89	-0.080	9.97	0.40
12	1.706	0.148	2.23	85	-1.8	109	86	-0.090	9.42	0.47
13	1.848	0.142	2.13	85	-4.01	98	88	-0.080	9.25	0.50
14	1.997	0.149	2.24	85	-2.54	108	88	-0.080	8.66	0.39
15	2.134	0.137	1.48	86	-2.5	98	87	-0.080	8.61	0.34
16	2.268	0.134	1.80	86	-4.52	95	87	-0.080	8.60	0.36
17	2.417	0.149	3.10	86	-0.9	106	83	-0.090	8.60	0.39
18	2.570	0.153	2.24	87	-3.02	105	88	-0.080	8.58	0.43
19	2.715	0.145	2.23	87	-0.65	107	88	-0.070	8.61	0.42
20	2.863	0.148	2.23	87	-3.11	105	88	-0.090	8.47	0.45
21	3.008	0.145	2.23	87	-1.5	108	88	-0.080	8.65	0.36
22	3.155	0.147	2.22	88	-2.01	105	87	-0.080	8.49	0.37
23	3.300	0.145	2.24	88	-0.95	103	87	-0.090	8.44	0.31
24	3.448	0.148	2.24	89	-2.35	103	88	-0.080	8.46	0.22
25	3.593	0.145	2.22	89	-3.13	97	87	-0.090	8.29	0.26
26	3.740	0.147	2.20	90	-2.91	105	87	-0.080	8.37	0.22
27	3.885	0.145	2.19	90	-1.7	105	86	-0.090	8.43	0.16
28	4.032	0.147	2.20	90	-2.89	104	86	-0.080	8.40	0.18
29	4.177	0.145	2.20	91	-2.42	98	87	-0.070	8.48	0.21
30	4.324	0.147	2.19	91	-2.35	104	87	-0.090	8.44	0.20
31	4.472	0.148	2.31	91	-1.34	97	87	-0.070	8.43	0.20

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.622	0.150	2.27	91	-3.25	105	88	-0.090	8.49	0.21
33	4.769	0.147	2.26	92	-0.82	100	88	-0.090	8.55	0.19
34	4.918	0.149	2.25	92	-2.4	108	88	-0.080	8.54	0.23
35	5.064	0.146	2.23	93	-2.45	100	87	-0.070	8.53	0.25
36	5.214	0.150	2.25	93	-1.75	106	87	-0.080	8.40	0.28
37	5.360	0.146	2.24	93	-2.75	99	87	-0.080	8.44	0.28
38	5.509	0.149	2.23	94	-0.93	106	87	-0.080	8.50	0.33
39	5.654	0.145	2.21	94	-3.08	100	87	-0.090	8.41	0.35
40	5.803	0.149	2.23	94	-2.89	107	86	-0.080	8.39	0.38
41	5.948	0.145	2.19	94	-1.21	105	86	-0.080	8.49	0.39
42	6.097	0.149	2.28	95	-1.84	106	87	-0.080	8.41	0.43
43	6.244	0.147	2.27	95	-1.87	104	87	-0.080	8.35	0.45
44	6.396	0.152	2.27	95	-0.93	99	87	-0.080	8.33	0.44
45	6.543	0.147	2.27	96	-2.74	108	88	-0.070	8.16	0.44
46	6.694	0.151	2.25	96	-3.07	106	87	-0.080	8.28	0.39
47	6.840	0.146	2.24	96	-1.26	101	87	-0.080	8.28	0.38
48	6.991	0.151	2.24	96	-3.33	104	87	-0.070	8.27	0.38
49	7.137	0.146	2.23	97	-1.24	106	87	-0.070	8.18	0.41
50	7.287	0.150	2.23	97	-1.18	109	87	-0.090	8.13	0.39
51	7.432	0.145	2.22	97	-3.46	96	86	-0.080	8.19	0.36
52	7.582	0.150	2.26	97	-1.45	103	86	-0.070	8.21	0.36
53	7.729	0.147	2.26	98	-1.2	103	87	-0.080	8.15	0.33
54	7.879	0.150	2.23	98	-3.41	104	88	-0.070	8.20	0.33
55	8.026	0.147	2.22	98	-2	106	87	-0.100	8.37	0.33
56	8.175	0.149	2.20	98	-1.71	105	87	-0.090	8.12	0.39
57	8.321	0.146	2.16	99	-1.78	104	87	-0.070	8.18	0.34
58	8.468	0.147	2.12	99	-2.86	96	87	-0.080	8.34	0.38
59	8.611	0.143	2.07	99	-2.16	103	87	-0.080	8.41	0.43
60	8.759	0.148	2.26	100	-1.96	101	87	-0.080	8.32	0.50
61	8.905	0.146	2.14	100	-3.5	104	87	-0.080	8.40	0.47
62	9.051	0.146	2.05	100	-2.3	96	86	-0.080	8.28	0.46
63	9.190	0.139	1.92	100	-2.62	94	86	-0.080	8.16	0.42

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.326	0.136	1.73	100	-3.54	97	88	-0.090	8.38	0.05
65	9.453	0.127	1.56	101	-5.18	89	87	-0.060	8.26	0.00
66	9.572	0.119	1.33	100	-6.37	84	87	-0.080	8.48	0.00
67	9.682	0.110	1.12	100	-7.15	77	87	-0.080	8.36	0.01
68	9.788	0.106	1.14	101	-6.72	72	87	-0.070	8.58	0.01
69	9.928	0.140	3.05	102	-1	90	85	-0.080	8.46	0.22
70	10.080	0.152	2.25	101	-1.56	98	88	-0.080	8.68	0.01
71	10.231	0.151	2.25	101	-2.17	105	89	-0.080	8.56	0.02
72	10.381	0.150	2.25	102	-1.18	101	89	-0.090	8.78	0.00
73	10.530	0.149	2.25	103	-1.93	102	87	-0.080	8.66	0.01
74	10.681	0.151	2.26	102	-1.25	108	88	-0.080	8.88	0.24
75	10.829	0.148	2.26	102	-2.08	101	87	-0.080	8.76	0.11
76	10.979	0.150	2.23	102	-1.94	104	87	-0.080	8.93	0.28
77	11.127	0.148	2.25	102	-1.41	106	86	-0.060	8.47	0.32
78	11.278	0.151	2.24	102	-1.65	102	86	-0.090	8.47	0.31
79	11.425	0.147	2.21	103	-1.86	104	87	-0.080	8.40	0.32
80	11.577	0.152	2.23	103	-1.67	106	87	-0.080	8.50	0.30
81	11.723	0.146	2.23	103	-1.85	101	87	-0.070	8.40	0.26
82	11.874	0.151	2.22	103	-1.29	108	87	-0.090	8.55	0.26
83	12.021	0.147	2.22	103	-1.33	101	87	-0.090	8.46	0.34
84	12.172	0.151	2.23	103	-2.48	109	87	-0.080	8.50	0.35
85	12.318	0.146	2.23	103	-1.28	102	86	-0.080	8.53	0.34
86	12.468	0.150	2.21	103	-2.46	106	86	-0.080	8.62	0.33
87	12.615	0.147	2.21	103	-2.22	97	86	-0.090	8.47	0.38
88	12.765	0.150	2.22	103	-1.29	111	87	-0.080	8.53	0.39
89	12.912	0.147	2.20	103	-2.43	100	87	-0.080	8.64	0.36
90	13.062	0.150	2.20	104	-1.32	101	87	-0.090	8.74	0.35
91	13.209	0.147	2.20	104	-1.7	100	87	-0.090	8.71	0.34
92	13.359	0.150	2.22	104	-2.01	104	87	-0.080	8.82	0.33
93	13.509	0.150	2.28	104	-2.65	98	87	-0.090	8.76	0.44
94	13.660	0.151	2.28	104	-2.15	104	87	-0.090	8.87	0.54
95	13.812	0.152	2.29	104	-2.55	108	86	-0.080	8.94	0.56

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4
Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	13.960	0.148	2.26	104	-1.9	103	86	-0.100	8.96	0.69
97	14.112	0.152	2.24	105	-1.36	102	87	-0.080	8.98	0.54
98	14.260	0.148	2.24	104	-1.49	99	88	-0.070	8.74	0.24
99	14.412	0.152	2.24	105	-2.56	104	87	-0.090	7.97	0.16
100	14.560	0.148	2.25	105	-1.55	99	87	-0.080	8.07	0.08
101	14.712	0.152	2.23	106	-2.65	101	87	-0.080	7.92	0.10
102	14.859	0.147	2.22	105	-2.21	99	88	-0.080	7.61	0.11
103	15.010	0.151	2.24	105	-2.06	103	88	-0.080	7.37	0.06
104	15.159	0.149	2.24	106	-2.66	110	88	-0.080	7.19	0.07
105	15.309	0.150	2.23	106	-2.32	92	87	-0.080	7.12	0.02
106	15.458	0.149	2.22	106	-2.07	97	88	-0.070	7.13	0.04
107	15.609	0.151	2.23	105	-2.48	97	86	-0.070	7.25	0.08
108	15.759	0.150	2.23	105	-2.36	101	88	-0.090	7.52	0.09
109	15.908	0.149	2.21	106	-1.66	105	88	-0.070	7.43	0.07
110	16.059	0.151	2.24	105	-2.25	103	87	-0.080	7.33	0.05
111	16.206	0.147	2.24	105	-2.02	102	87	-0.080	6.80	0.07
112	16.358	0.152	2.23	105	-1.82	103	87	-0.080	6.34	0.05
113	16.505	0.147	2.23	105	-1.29	103	87	-0.080	6.21	0.05
114	16.657	0.152	2.22	106	-2.63	103	86	-0.070	6.02	0.09
115	16.805	0.148	2.23	107	-1.48	105	87	-0.070	5.88	0.08
116	16.957	0.152	2.23	106	-2.7	101	87	-0.060	5.71	0.09
117	17.105	0.148	2.21	106	-2.42	99	86	-0.050	5.42	0.08
118	17.257	0.152	2.22	106	-2.46	109	87	-0.070	5.29	0.10
119	17.403	0.146	2.24	107	-2.03	101	87	-0.070	5.45	0.09
120	17.555	0.152	2.23	106	-1.82	104	89	-0.070	5.27	0.11
121	17.703	0.148	2.23	106	-1.8	102	87	-0.070	5.43	0.11
122	17.854	0.151	2.22	106	-2.7	105	87	-0.060	5.20	0.14
123	18.004	0.150	2.23	106	-1.31	100	87	-0.080	5.18	0.16
124	18.154	0.150	2.24	107	-1.83	102	86	-0.070	5.19	0.17
125	18.304	0.150	2.23	107	-2.54	102	86	-0.070	5.15	0.15
126	18.453	0.149	2.23	106	-2.33	102	86	-0.070	5.29	0.16
127	18.603	0.150	2.23	106	-2.71	99	87	-0.060	5.32	0.17

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	18.751	0.148	2.23	107	-2.25	97	87	-0.070	5.42	0.18
129	18.903	0.152	2.22	106	-1.92	102	87	-0.060	5.68	0.15
130	19.051	0.148	2.24	106	-1.33	92	88	-0.060	5.82	0.17
131	19.203	0.152	2.24	107	-2.12	99	87	-0.070	5.94	0.18
132	19.350	0.147	2.23	106	-2.17	93	88	-0.070	5.65	0.13
133	19.503	0.153	2.24	108	-1.26	100	86	-0.060	5.47	0.16
134	19.650	0.147	2.24	107	-2.77	92	86	-0.070	5.11	0.19
135	19.801	0.151	2.20	107	-2.77	112	86	-0.070	4.91	0.23
136	19.949	0.148	2.24	107	-1.41	101	87	-0.060	5.01	0.24
137	20.100	0.151	2.23	107	-2.67	104	87	-0.080	4.89	0.24
138	20.250	0.150	2.22	107	-2.31	105	87	-0.060	4.71	0.29
139	20.400	0.150	2.24	107	-1.34	98	87	-0.070	4.79	0.28
140	20.551	0.151	2.23	108	-1.74	101	87	-0.070	4.86	0.28
141	20.700	0.149	2.22	107	-2.35	98	86	-0.060	4.77	0.30
142	20.850	0.150	2.23	107	-2.04	104	86	-0.070	4.73	0.26
143	20.999	0.149	2.23	107	-1.3	96	86	-0.060	4.55	0.30
144	21.150	0.151	2.23	107	-2.23	100	87	-0.060	4.59	0.31
145	21.298	0.148	2.23	107	-1.94	101	86	-0.060	4.52	0.32
146	21.451	0.153	2.23	107	-2.04	106	87	-0.070	4.36	0.33
147	21.598	0.147	2.23	107	-2.01	100	87	-0.040	4.20	0.35
148	21.751	0.153	2.23	107	-1.29	107	87	-0.060	4.16	0.34
149	21.898	0.147	2.24	107	-1.3	99	86	-0.050	3.98	0.45
150	22.049	0.151	2.22	107	-2.62	103	86	-0.060	3.75	0.62
151	22.197	0.148	2.24	107	-1.73	100	86	-0.050	3.88	0.61
152	22.349	0.152	2.22	108	-2.46	100	88	-0.060	3.74	0.59
153	22.499	0.150	2.23	107	-1.32	101	86	-0.050	3.62	0.58
154	22.649	0.150	2.24	107	-2.69	99	87	-0.050	3.82	0.56
155	22.800	0.151	2.21	108	-1.94	103	88	-0.060	3.83	0.53
156	22.949	0.149	2.22	107	-2.78	102	87	-0.060	3.79	0.50
157	23.099	0.150	2.22	108	-2.34	98	86	-0.060	3.84	0.47
158	23.248	0.149	2.25	108	-1.4	102	86	-0.060	3.69	0.48
159	23.399	0.151	2.23	108	-1.39	107	86	-0.050	3.62	0.46

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	23.548	0.149	2.22	108	-2.2	98	86	-0.050	3.74	0.45
161	23.700	0.152	2.23	107	-2.18	100	86	-0.050	3.75	0.46
162	23.848	0.148	2.23	107	-1.37	98	86	-0.060	3.71	0.45
163	24.000	0.152	2.22	107	-2.73	105	86	-0.050	3.72	0.44
164	24.147	0.147	2.23	107	-2.27	99	86	-0.060	3.47	0.47
165	24.299	0.152	2.23	108	-2	97	86	-0.060	3.79	0.44
166	24.447	0.148	2.22	108	-1.53	94	86	-0.050	3.62	0.48
167	24.599	0.152	2.24	108	-2.72	105	86	-0.050	3.54	0.47
168	24.749	0.150	2.22	108	-2.58	100	86	-0.060	3.70	0.42
169	24.899	0.150	2.24	107	-1.99	100	86	-0.040	3.73	0.43
170	25.050	0.151	2.24	108	-2.18	102	86	-0.050	3.72	0.46
171	25.198	0.148	2.24	108	-1.41	100	87	-0.050	3.81	0.42
172	25.350	0.152	2.23	108	-1.76	101	87	-0.050	3.53	0.44
173	25.498	0.148	2.24	107	-2.37	95	86	-0.040	3.71	0.37
174	25.651	0.153	2.24	107	-2.71	102	86	-0.050	3.80	0.39
175	25.799	0.148	2.23	108	-1.61	104	86	-0.040	3.57	0.44
176	25.951	0.152	2.23	108	-2.42	101	87	-0.040	3.52	0.44
177	26.099	0.148	2.24	108	-1.3	99	86	-0.060	3.58	0.43
178	26.251	0.152	2.24	108	-1.34	99	87	-0.060	3.54	0.46
179	26.399	0.148	2.23	108	-1.56	97	86	-0.050	3.52	0.44
180	26.550	0.151	2.23	108	-1.3	101	86	-0.050	3.61	0.41
181	26.700	0.150	2.22	108	-1.52	98	86	-0.060	3.55	0.43
182	26.851	0.151	2.23	108	-2.53	98	87	-0.050	3.69	0.39
183	27.001	0.150	2.22	108	-1.27	96	86	-0.050	3.62	0.40
184	27.151	0.150	2.23	108	-2.15	101	86	-0.030	3.49	0.43
185	27.301	0.150	2.24	108	-2.76	100	86	-0.060	3.40	0.46
186	27.450	0.149	2.24	108	-2.23	97	87	-0.040	3.51	0.46
187	27.601	0.151	2.24	108	-1.56	103	87	-0.050	3.46	0.46
188	27.750	0.149	2.23	108	-2.09	95	86	-0.050	3.42	0.44
189	27.903	0.153	2.24	108	-1.27	100	86	-0.030	3.43	0.41
190	28.051	0.148	2.24	108	-1.39	99	86	-0.060	3.52	0.42
191	28.203	0.152	2.23	108	-2.41	96	86	-0.050	3.38	0.46

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	28.351	0.148	2.24	108	-2.41	95	87	-0.050	3.48	0.41
193	28.503	0.152	2.23	108	-2.17	104	86	-0.050	3.41	0.41
194	28.651	0.148	2.22	108	-2.13	100	86	-0.050	3.32	0.44
195	28.803	0.152	2.23	108	-1.36	98	86	-0.070	3.40	0.43
196	28.953	0.150	2.22	108	-2.41	95	86	-0.050	3.54	0.42
197	29.103	0.150	2.22	108	-2.83	107	86	-0.050	3.46	0.45
198	29.254	0.151	2.23	108	-1.35	101	85	-0.050	3.51	0.43
199	29.402	0.148	2.23	108	-2.66	101	86	-0.060	3.37	0.42
200	29.554	0.152	2.23	108	-1.6	103	86	-0.050	3.37	0.44
201	29.702	0.148	2.23	108	-2.14	95	86	-0.050	3.36	0.45
202	29.855	0.153	2.24	108	-2.69	103	86	-0.040	3.43	0.44
203	30.003	0.148	2.23	108	-1.53	95	86	-0.040	3.44	0.40
204	30.156	0.153	2.22	108	-1.88	100	86	-0.050	3.44	0.42
205	30.303	0.147	2.23	108	-2.71	99	87	-0.050	3.55	0.41
206	30.455	0.152	2.23	108	-1.28	103	86	-0.050	3.53	0.43
207	30.603	0.148	2.24	108	-2.78	101	86	-0.050	3.46	0.39
208	30.754	0.151	2.22	108	-2.2	101	86	-0.050	3.38	0.44
209	30.904	0.150	2.22	108	-1.74	101	86	-0.050	3.41	0.43
210	31.055	0.151	2.23	108	-2.7	100	86	-0.070	3.47	0.41
211	31.206	0.151	2.22	108	-1.38	102	86	-0.050	3.52	0.40
212	31.355	0.149	2.24	108	-1.7	98	87	-0.040	3.48	0.44
213	31.505	0.150	2.22	108	-2.7	100	85	-0.060	3.30	0.40
214	31.654	0.149	2.23	108	-2.64	100	85	-0.040	3.23	0.40
215	31.806	0.152	2.23	108	-2.57	107	86	-0.040	3.31	0.38
216	31.954	0.148	2.23	108	-2.68	100	86	-0.040	3.39	0.38
217	32.107	0.153	2.22	108	-2.71	106	87	-0.050	3.25	0.42
218	32.255	0.148	2.22	108	-2.02	94	86	-0.050	3.36	0.37
219	32.407	0.152	2.23	108	-2.75	99	86	-0.050	3.27	0.41
220	32.554	0.147	2.23	108	-1.31	95	86	-0.050	3.30	0.41
221	32.706	0.152	2.23	108	-1.47	104	85	-0.050	3.39	0.37
222	32.854	0.148	2.23	108	-2.32	98	87	-0.040	3.25	0.41
223	33.007	0.153	2.23	108	-2.75	101	86	-0.050	3.31	0.39

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	33.156	0.149	2.23	108	-2.05	101	86	-0.050	3.32	0.40
225	33.307	0.151	2.23	108	-1.5	101	86	-0.040	3.30	0.42
226	33.458	0.151	2.23	108	-1.45	101	86	-0.060	3.19	0.40
227	33.605	0.147	2.23	108	-2.41	101	86	-0.050	3.31	0.40
228	33.757	0.152	2.23	108	-1.57	98	86	-0.050	3.16	0.44
229	33.905	0.148	2.24	108	-2.37	98	85	-0.040	3.30	0.41
230	34.058	0.153	2.25	108	-1.46	102	86	-0.050	3.12	0.45
231	34.206	0.148	2.24	108	-1.37	100	89	-0.040	3.24	0.44
232	34.359	0.153	2.22	108	-1.23	101	86	-0.040	3.21	0.45
233	34.506	0.147	2.23	108	-1.48	99	86	-0.050	3.33	0.42
234	34.658	0.152	2.23	108	-1.77	101	86	-0.040	3.16	0.45
235	34.806	0.148	2.23	108	-2.11	103	86	-0.050	3.22	0.45
236	34.957	0.151	2.23	108	-2.71	98	86	-0.040	3.28	0.42
237	35.107	0.150	2.22	108	-2.68	104	86	-0.040	3.16	0.40
238	35.258	0.151	2.23	108	-1.65	101	85	-0.040	3.13	0.43
239	35.409	0.151	2.22	109	-2.13	101	86	-0.060	3.23	0.40
240	35.558	0.149	2.22	108	-2.5	100	88	-0.040	3.26	0.37
241	35.708	0.150	2.23	108	-2.55	100	86	-0.050	3.12	0.39
242	35.857	0.149	2.23	108	-1.34	99	86	-0.050	3.13	0.38
243	36.009	0.152	2.22	108	-2.73	102	86	-0.050	3.20	0.39
244	36.157	0.148	2.22	109	-2.45	97	87	-0.050	3.13	0.35
245	36.310	0.153	2.24	108	-1.42	106	86	-0.040	3.12	0.39
246	36.458	0.148	2.22	108	-2.38	94	87	-0.050	3.14	0.36
247	36.610	0.152	2.23	108	-2.11	98	86	-0.050	3.14	0.38
248	36.757	0.147	2.22	108	-2.71	94	87	-0.030	3.19	0.36
249	36.910	0.153	2.24	108	-2.81	104	86	-0.040	3.15	0.38
250	37.058	0.148	2.22	108	-2.02	99	86	-0.070	3.17	0.39
251	37.210	0.152	2.22	108	-1.98	103	86	-0.040	3.16	0.36
252	37.360	0.150	2.21	108	-1.22	97	86	-0.060	3.12	0.39
253	37.510	0.150	2.22	108	-1.3	98	86	-0.060	3.09	0.38
254	37.661	0.151	2.23	108	-1.47	97	85	-0.050	3.24	0.37
255	37.809	0.148	2.22	108	-1.44	93	86	-0.030	3.05	0.40

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	37.961	0.152	2.23	108	-1.95	100	86	-0.040	3.08	0.38
257	38.108	0.147	2.22	108	-2.53	98	86	-0.040	3.19	0.39
258	38.261	0.153	2.23	108	-1.38	100	87	-0.030	3.17	0.40
259	38.409	0.148	2.23	108	-1.39	95	86	-0.040	3.25	0.38
260	38.562	0.153	2.22	108	-2.44	102	86	-0.040	3.14	0.41
261	38.710	0.148	2.23	108	-2.7	97	85	-0.050	3.10	0.39
262	38.861	0.151	2.22	108	-1.91	102	85	-0.060	3.16	0.41
263	39.010	0.149	2.23	108	-2.7	94	86	-0.050	3.11	0.39
264	39.161	0.151	2.21	108	-2.58	98	87	-0.040	3.22	0.39
265	39.311	0.150	2.24	108	-2.02	91	86	-0.040	3.26	0.40
266	39.462	0.151	2.23	108	-2.29	104	88	-0.020	3.15	0.42
267	39.613	0.151	2.20	109	-2.53	102	88	-0.040	3.16	0.41
268	39.761	0.148	2.23	107	-1.39	96	85	-0.040	3.19	0.40
269	39.912	0.151	2.20	108	-1.52	101	85	-0.050	3.26	0.40
270	40.061	0.149	2.24	108	-1.26	100	86	-0.050	3.19	0.42
271	40.213	0.152	2.22	108	-2.27	101	87	-0.050	3.16	0.45
272	40.361	0.148	2.22	108	-1.54	100	86	-0.050	3.28	0.41
273	40.514	0.153	2.23	108	-2.07	99	86	-0.040	3.21	0.44
274	40.662	0.148	2.23	108	-2.84	101	86	-0.030	3.14	0.45
275	40.814	0.152	2.23	108	-2.55	98	86	-0.040	3.23	0.41
276	40.961	0.147	2.22	108	-2.76	98	85	-0.040	3.25	0.42
277	41.113	0.152	2.23	109	-1.96	106	85	-0.040	3.29	0.42
278	41.262	0.149	2.23	108	-2.62	100	86	-0.050	3.10	0.44
279	41.414	0.152	2.22	107	-1.94	103	86	-0.060	3.13	0.44
280	41.564	0.150	2.21	107	-2.26	96	86	-0.050	3.17	0.44
281	41.714	0.150	2.23	107	-2.46	99	86	-0.040	3.28	0.44
282	41.865	0.151	2.22	107	-1.46	103	88	-0.050	3.33	0.43
283	42.013	0.148	2.22	108	-2.77	98	86	-0.050	3.16	0.44
284	42.164	0.151	2.25	107	-2.76	101	85	-0.040	3.21	0.43
285	42.312	0.148	2.22	107	-2.71	100	85	-0.030	3.09	0.44
286	42.465	0.153	2.22	107	-1.73	99	86	-0.050	3.06	0.46
287	42.613	0.148	2.23	108	-2.63	97	87	-0.040	3.09	0.43

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	42.766	0.153	2.22	108	-2.66	102	86	-0.030	3.16	0.43
289	42.913	0.147	2.23	107	-1.32	101	86	-0.040	3.09	0.41
290	43.065	0.152	2.22	107	-1.35	104	86	-0.050	3.11	0.41
291	43.213	0.148	2.23	107	-2.77	102	86	-0.040	3.04	0.43
292	43.364	0.151	2.22	107	-1.61	98	85	-0.060	3.06	0.41
293	43.514	0.150	2.23	107	-2.29	100	86	-0.080	3.14	0.39
294	43.665	0.151	2.22	109	-2.49	97	86	-0.060	3.14	0.39
295	43.816	0.151	2.21	108	-1.64	98	87	-0.040	3.14	0.38
296	43.964	0.148	2.23	108	-1.45	98	87	-0.050	2.91	0.39
297	44.115	0.151	2.22	107	-1.26	101	86	-0.040	2.89	0.38
298	44.264	0.149	2.23	108	-1.79	94	86	-0.050	2.80	0.39
299	44.416	0.152	2.21	107	-1.28	98	86	-0.050	2.83	0.38
300	44.564	0.148	2.22	107	-2.43	94	85	-0.040	3.03	0.34
301	44.717	0.153	2.22	108	-1.83	100	86	-0.050	2.81	0.37
302	44.865	0.148	2.22	108	-2.73	97	88	-0.040	2.79	0.36
303	45.017	0.152	2.24	108	-1.71	102	86	-0.040	2.85	0.35
304	45.165	0.148	2.22	108	-2.65	92	86	-0.040	2.79	0.33
305	45.316	0.151	2.22	108	-2.02	99	88	-0.040	2.94	0.35
306	45.465	0.149	2.22	108	-1.39	98	86	-0.060	2.91	0.32
307	45.617	0.152	2.21	108	-2.6	100	85	-0.040	2.84	0.34
308	45.767	0.150	2.22	107	-2.64	100	85	-0.050	2.80	0.33
309	45.917	0.150	2.23	107	-1.25	101	86	-0.030	2.78	0.34
310	46.068	0.151	2.23	107	-2.43	98	87	-0.040	2.81	0.35
311	46.216	0.148	2.23	107	-1.62	98	86	-0.040	2.91	0.36
312	46.368	0.152	2.21	107	-1.88	102	86	-0.040	2.81	0.33
313	46.516	0.148	2.22	107	-1.34	100	86	-0.050	2.88	0.36
314	46.669	0.153	2.21	108	-1.49	98	86	-0.050	2.77	0.37
315	46.816	0.147	2.22	109	-2.41	99	87	-0.030	2.96	0.32
316	46.970	0.154	2.24	107	-2.09	106	86	-0.040	2.81	0.37
317	47.117	0.147	2.23	107	-1.7	97	86	-0.040	2.91	0.34
318	47.269	0.152	2.23	107	-1.36	102	86	-0.060	2.90	0.33
319	47.417	0.148	2.24	107	-1.93	98	86	-0.050	2.87	0.34

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	47.568	0.151	2.21	107	-2.7	102	86	-0.050	2.74	0.34
321	47.718	0.150	2.22	107	-2.26	95	86	-0.060	2.81	0.33
322	47.868	0.150	2.23	107	-2.7	103	86	-0.040	2.85	0.34
323	48.020	0.152	2.22	108	-2.09	102	85	-0.040	2.78	0.35
324	48.168	0.148	2.24	107	-2.22	97	85	-0.040	2.73	0.36
325	48.319	0.151	2.23	107	-1.34	102	86	-0.050	2.77	0.35
326	48.467	0.148	2.23	108	-2.15	95	87	-0.030	2.86	0.33
327	48.619	0.152	2.22	107	-2.75	103	86	-0.040	2.77	0.33
328	48.768	0.149	2.20	107	-2.64	101	86	-0.040	2.78	0.33
329	48.920	0.152	2.22	107	-2.42	98	86	-0.060	2.97	0.32
330	49.068	0.148	2.22	108	-2.1	97	86	-0.040	2.88	0.31
331	49.220	0.152	2.25	107	-2.62	100	85	-0.050	2.81	0.34
332	49.368	0.148	2.22	108	-1.84	99	86	-0.040	2.76	0.33
333	49.519	0.151	2.23	107	-2.64	102	86	-0.050	2.70	0.33
334	49.668	0.149	2.22	108	-2.79	100	86	-0.040	2.79	0.30
335	49.820	0.152	2.22	107	-1.97	98	86	-0.030	2.81	0.33
336	49.970	0.150	2.23	107	-1.24	102	86	-0.040	2.75	0.33
337	50.120	0.150	2.23	107	-2.62	98	85	-0.040	2.66	0.34
338	50.271	0.151	2.24	107	-1.67	98	85	-0.050	2.62	0.32
339	50.419	0.148	2.22	107	-2.17	98	87	-0.040	2.87	0.30
340	50.571	0.152	2.23	108	-1.43	98	86	-0.040	2.78	0.31
341	50.719	0.148	2.21	108	-2.72	97	86	-0.040	2.69	0.31
342	50.872	0.153	2.23	108	-1.54	101	87	-0.060	2.81	0.32
343	51.020	0.148	2.21	107	-1.8	94	86	-0.040	2.81	0.31
344	51.173	0.153	2.23	107	-2.45	106	86	-0.040	2.72	0.34
345	51.320	0.147	2.23	107	-2.31	101	86	-0.050	2.76	0.31
346	51.472	0.152	2.23	107	-1.42	99	85	-0.030	2.79	0.29
347	51.620	0.148	2.23	107	-1.34	99	86	-0.060	2.86	0.32
348	51.771	0.151	2.22	107	-1.32	95	86	-0.040	2.83	0.31
349	51.921	0.150	2.21	108	-2.29	99	86	-0.040	2.70	0.35
350	52.072	0.151	2.22	107	-1.31	96	86	-0.030	2.73	0.38
351	52.223	0.151	2.24	108	-1.31	100	87	-0.050	2.81	0.34

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	52.371	0.148	2.23	108	-1.83	97	86	-0.040	2.79	0.32
353	52.523	0.152	2.24	107	-2.82	107	85	-0.040	2.71	0.35
354	52.670	0.147	2.23	108	-2.65	98	85	-0.030	2.83	0.31
355	52.823	0.153	2.23	107	-2.66	97	86	-0.050	2.89	0.31
356	52.971	0.148	2.22	108	-2.47	94	86	-0.030	2.72	0.33
357	53.124	0.153	2.22	107	-2.18	101	86	-0.040	2.83	0.31
358	53.272	0.148	2.23	107	-2.33	96	87	-0.040	2.72	0.34
359	53.423	0.151	2.23	107	-2.89	102	86	-0.050	2.80	0.32
360	53.571	0.148	2.22	107	-1.95	99	86	-0.040	2.83	0.33
361	53.723	0.152	2.23	109	-2.27	96	86	-0.030	2.86	0.31
362	53.871	0.148	2.22	107	-1.32	102	85	-0.050	2.83	0.35
363	54.023	0.152	2.23	108	-1.69	97	86	-0.040	2.69	0.37
364	54.173	0.150	2.22	108	-2.78	94	86	-0.030	2.91	0.32
365	54.323	0.150	2.24	108	-2.32	100	87	-0.040	2.94	0.32
366	54.474	0.151	2.24	107	-1.3	101	86	-0.040	2.69	0.35
367	54.622	0.148	2.22	107	-2.3	98	86	-0.050	2.81	0.38
368	54.774	0.152	2.23	107	-2.42	98	86	-0.040	2.80	0.35
369	54.922	0.148	2.23	107	-2.44	97	85	-0.040	2.67	0.34
370	55.075	0.153	2.23	107	-1.98	100	87	-0.030	2.80	0.33
371	55.222	0.147	2.22	107	-2.54	96	88	-0.040	2.89	0.32
372	55.376	0.154	2.24	107	-1.26	105	86	-0.050	2.83	0.33
373	55.523	0.147	2.23	107	-1.38	97	86	-0.040	2.68	0.34
374	55.674	0.151	2.23	108	-2.76	100	86	-0.050	2.51	0.36
375	55.822	0.148	2.24	108	-1.67	94	87	-0.020	2.61	0.33
376	55.974	0.152	2.23	107	-2.32	103	86	-0.040	2.64	0.36
377	56.124	0.150	2.23	108	-2.67	103	85	-0.040	2.73	0.31
378	56.274	0.150	2.22	107	-2.67	97	85	-0.050	2.69	0.31
379	56.425	0.151	2.22	107	-2.65	100	86	-0.050	2.57	0.35
380	56.574	0.149	2.23	107	-2.5	95	86	-0.050	2.57	0.35
381	56.725	0.151	2.22	107	-1.39	103	86	-0.040	2.64	0.34
382	56.873	0.148	2.22	107	-1.39	92	87	-0.030	2.75	0.30
383	57.026	0.153	2.22	107	-2.6	99	86	-0.050	2.71	0.31

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
384	57.174	0.148	2.22	107	-1.86	98	86	-0.040	2.63	0.35
385	57.326	0.152	2.23	108	-1.33	101	86	-0.030	2.76	0.30
386	57.474	0.148	2.21	107	-2.67	97	85	-0.040	2.74	0.32
387	57.626	0.152	2.23	108	-2.74	98	86	-0.030	2.76	0.36
388	57.773	0.147	2.22	107	-1.73	98	86	-0.040	2.78	0.32
389	57.925	0.152	2.22	107	-2.32	100	86	-0.040	2.57	0.36
390	58.074	0.149	2.22	107	-1.41	97	86	-0.040	2.74	0.35
391	58.225	0.151	2.22	107	-2.77	102	85	-0.040	2.79	0.30
392	58.376	0.151	2.23	107	-2.69	97	86	-0.050	2.62	0.31
393	58.526	0.150	2.21	107	-1.58	94	85	-0.040	2.58	0.33
394	58.676	0.150	2.23	107	-2.03	97	86	-0.040	2.76	0.32
395	58.824	0.148	2.23	107	-2.26	102	88	-0.040	2.69	0.34
396	58.976	0.152	2.23	108	-2.05	93	86	-0.040	2.63	0.31
397	59.124	0.148	2.23	107	-1.69	97	86	-0.050	2.51	0.34
398	59.277	0.153	2.22	108	-1.82	101	86	-0.040	2.68	0.33
399	59.425	0.148	2.22	107	-1.49	98	86	-0.050	2.56	0.34
400	59.577	0.152	2.21	107	-1.53	104	85	-0.040	2.63	0.33
401	59.725	0.148	2.23	107	-2.59	99	85	-0.040	2.30	0.33
402	59.876	0.151	2.23	107	-2.62	98	86	-0.060	3.46	0.74
403	60.024	0.148	2.23	108	-1.82	97	87	-0.050	3.48	0.71
404	60.176	0.152	2.22	108	-1.89	101	86	-0.040	3.44	0.67
405	60.326	0.150	2.23	107	-2.2	103	86	-0.050	3.43	0.70
406	60.476	0.150	2.22	107	-2.48	97	86	-0.040	3.39	0.65
407	60.627	0.151	2.23	107	-1.33	100	86	-0.040	3.26	0.66
408	60.776	0.149	2.23	107	-1.92	101	85	-0.050	3.28	0.67
409	60.926	0.150	2.22	107	-2.39	100	85	-0.040	3.32	0.60
410	61.075	0.149	2.23	107	-1.36	101	87	-0.040	3.33	0.59
411	61.226	0.151	2.23	107	-1.5	94	87	-0.050	3.10	0.61
412	61.375	0.149	2.23	107	-1.6	99	86	-0.040	3.27	0.58
413	61.528	0.153	2.22	107	-2	102	87	-0.040	3.23	0.58
414	61.675	0.147	2.23	107	-2.29	100	86	-0.030	3.34	0.63
415	61.828	0.153	2.24	107	-2.04	102	86	-0.040	3.19	0.60

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
416	61.975	0.147	2.23	108	-1.32	97	85	-0.040	3.29	0.62
417	62.127	0.152	2.24	107	-2.77	99	85	-0.040	3.49	0.53
418	62.275	0.148	2.23	108	-1.79	98	85	-0.040	3.53	0.51
419	62.426	0.151	2.22	109	-2.03	97	86	-0.050	3.46	0.52
420	62.576	0.150	2.22	107	-1.84	104	86	-0.040	3.40	0.53
421	62.726	0.150	2.22	107	-2.47	102	86	-0.050	3.44	0.50
422	62.878	0.152	2.22	107	-1.69	99	86	-0.050	3.33	0.51
423	63.026	0.148	2.23	107	-2.52	95	87	-0.040	3.39	0.53
424	63.177	0.151	2.23	107	-1.8	103	85	-0.050	3.33	0.53
425	63.325	0.148	2.23	107	-1.99	99	85	-0.060	3.30	0.59
426	63.477	0.152	2.22	107	-1.79	102	85	-0.040	3.31	0.56
427	63.625	0.148	2.22	107	-1.71	97	87	-0.030	3.34	0.53
428	63.778	0.153	2.23	108	-2.73	104	87	-0.040	3.23	0.60
429	63.926	0.148	2.22	108	-1.78	97	86	-0.040	3.26	0.57
430	64.077	0.151	2.23	107	-1.57	100	86	-0.040	3.30	0.56
431	64.225	0.148	2.22	107	-2.16	97	86	-0.050	2.95	0.49
432	64.376	0.151	2.23	107	-2.43	103	85	-0.040	2.88	0.55
433	64.525	0.149	2.21	108	-1.67	98	87	-0.040	2.87	0.57
434	64.676	0.151	2.22	107	-1.38	99	86	-0.050	2.95	0.55
435	64.826	0.150	2.22	108	-2.63	103	86	-0.040	2.92	0.57
436	64.976	0.150	2.22	107	-1.29	98	86	-0.050	3.04	0.53
437	65.127	0.151	2.23	107	-2.07	99	86	-0.040	2.85	0.58
438	65.275	0.148	2.24	107	-2.66	96	86	-0.050	3.11	0.56
439	65.427	0.152	2.23	107	-2.7	106	85	-0.050	3.00	0.55
440	65.574	0.147	2.22	108	-2.8	101	87	-0.050	2.95	0.54
441	65.727	0.153	2.23	107	-2.15	101	86	-0.050	3.01	0.54
442	65.875	0.148	2.22	107	-2.09	97	86	-0.050	2.95	0.55
443	66.027	0.152	2.22	107	-2.54	96	86	-0.040	2.93	0.54
444	66.175	0.148	2.23	107	-2.69	99	87	-0.040	2.97	0.52
445	66.326	0.151	2.21	107	-2.68	101	86	-0.050	3.09	0.51
446	66.474	0.148	2.23	107	-2.71	94	86	-0.040	2.90	0.53
447	66.626	0.152	2.22	107	-2.37	103	86	-0.050	2.93	0.51

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
448	66.774	0.148	2.22	108	-2.84	101	87	-0.050	2.97	0.50
449	66.926	0.152	2.22	107	-2.01	98	85	-0.040	2.97	0.46
450	67.076	0.150	2.21	108	-1.45	100	87	-0.050	2.98	0.49
451	67.226	0.150	2.22	107	-2.09	97	86	-0.040	3.07	0.48
452	67.376	0.150	2.23	107	-2.2	98	86	-0.030	3.07	0.49
453	67.524	0.148	2.21	107	-2.29	98	87	-0.030	2.96	0.48
454	67.676	0.152	2.23	108	-2.25	100	86	-0.050	2.96	0.50
455	67.824	0.148	2.22	107	-1.98	98	85	-0.040	2.97	0.51
456	67.977	0.153	2.23	107	-1.3	100	85	-0.030	3.05	0.48
457	68.124	0.147	2.22	107	-1.38	98	86	-0.060	2.87	0.51
458	68.277	0.153	2.21	107	-2.39	98	86	-0.040	2.90	0.54
459	68.424	0.147	2.23	107	-2.57	99	86	-0.020	2.86	0.51
460	68.576	0.152	2.22	107	-1.35	100	87	-0.040	2.75	0.50
461	68.724	0.148	2.22	107	-2.47	102	86	-0.040	2.82	0.48
462	68.875	0.151	2.23	107	-1.31	99	86	-0.040	2.84	0.48
463	69.025	0.150	2.22	107	-1.29	100	85	-0.040	2.83	0.49
464	69.176	0.151	2.22	107	-2.22	102	86	-0.050	2.90	0.49
465	69.326	0.150	2.22	107	-2.7	100	86	-0.030	3.08	0.47
466	69.475	0.149	2.23	107	-2.54	99	86	-0.060	2.87	0.49
467	69.626	0.151	2.24	107	-2.68	100	86	-0.050	2.83	0.46
468	69.774	0.148	2.24	107	-1.34	97	86	-0.050	2.84	0.46
469	69.926	0.152	2.24	107	-2.76	98	86	-0.040	2.75	0.45
470	70.074	0.148	2.22	107	-2.78	96	86	-0.040	2.65	0.47
471	70.227	0.153	2.22	107	-2.63	102	85	-0.040	2.72	0.50
Avg/Tot	70.227	0.149	2.21	105	-2.11	100			4.52	0.37

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	576	522	383	339	369	437.8	N/A
1	575	522	388	335	370	438.0	N/A
2	570	521	393	331	372	437.4	N/A
3	562	517	397	330	374	436.0	N/A
4	552	513	399	333	375	434.4	N/A
5	544	509	400	339	376	433.6	N/A
6	536	507	400	350	376	433.8	N/A
7	530	505	398	363	376	434.4	N/A
8	525	503	396	377	379	436.0	N/A
9	523	502	395	392	380	438.4	N/A
10	523	502	393	405	382	441.0	N/A
11	523	502	391	416	384	443.2	N/A
12	523	501	389	426	385	444.8	N/A
13	524	501	388	433	386	446.4	N/A
14	523	500	386	440	388	447.4	N/A
15	522	500	385	445	388	448.0	N/A
16	522	499	385	449	389	448.8	N/A
17	521	499	383	452	390	449.0	N/A
18	520	499	382	456	391	449.6	N/A
19	520	499	381	456	391	449.4	N/A
20	519	498	381	457	390	449.0	N/A
21	517	498	381	462	390	449.6	N/A
22	516	498	380	462	390	449.2	N/A
23	516	497	379	464	390	449.2	N/A
24	515	498	378	464	389	448.8	N/A
25	513	498	378	465	389	448.6	N/A
26	513	498	378	465	388	448.4	N/A
27	512	498	377	468	387	448.4	N/A
28	511	499	377	466	387	448.0	N/A
29	510	498	376	469	386	447.8	N/A
30	509	498	376	470	385	447.6	N/A
31	509	500	376	474	384	448.6	N/A
32	508	500	374	479	381	448.4	N/A
33	508	501	372	479	380	448.0	N/A
34	508	501	370	477	378	446.8	N/A
35	507	501	367	476	375	445.2	N/A
36	506	501	365	475	373	444.0	N/A
37	506	501	362	473	370	442.4	N/A
38	505	501	360	470	369	441.0	N/A
39	504	502	358	468	367	439.8	N/A
40	504	502	356	465	365	438.4	N/A
41	503	503	354	465	363	437.6	N/A
42	502	502	353	462	361	436.0	N/A
43	501	502	351	460	359	434.6	N/A
44	501	502	350	458	357	433.6	N/A
45	501	503	349	457	356	433.2	N/A
46	501	503	347	455	353	431.8	N/A
47	501	502	346	454	352	431.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 4
Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	501	503	346	452	350	430.4	N/A
49	501	503	344	450	349	429.4	N/A
50	501	503	343	448	347	428.4	N/A
51	501	503	342	446	346	427.6	N/A
52	501	503	342	445	345	427.2	N/A
53	501	504	341	443	342	426.2	N/A
54	501	503	341	442	341	425.6	N/A
55	501	503	340	442	340	425.2	N/A
56	501	503	340	441	339	424.8	N/A
57	501	503	339	439	338	424.0	N/A
58	501	503	339	439	338	424.0	N/A
59	502	504	339	441	336	424.4	N/A
60	502	504	339	441	336	424.4	N/A
61	504	504	338	441	336	424.6	N/A
62	504	504	338	442	334	424.4	N/A
63	504	504	339	442	333	424.4	N/A
64	505	504	339	442	332	424.4	N/A
65	505	505	339	443	331	424.6	N/A
66	506	505	339	443	332	425.0	N/A
67	507	505	339	443	331	425.0	N/A
68	507	505	340	443	329	424.8	N/A
69	509	505	340	443	329	425.2	N/A
70	509	505	340	444	329	425.4	N/A
71	510	506	341	444	328	425.8	N/A
72	511	506	341	444	327	425.8	N/A
73	511	506	343	443	327	426.0	N/A
74	512	506	343	444	326	426.2	N/A
75	513	508	343	444	326	426.8	N/A
76	514	507	344	445	327	427.4	N/A
77	514	508	345	446	325	427.6	N/A
78	516	508	346	445	325	428.0	N/A
79	516	509	347	446	324	428.4	N/A
80	517	509	348	445	325	428.8	N/A
81	518	510	349	445	324	429.2	N/A
82	518	510	350	445	324	429.4	N/A
83	519	511	351	446	324	430.2	N/A
84	520	511	351	446	323	430.2	N/A
85	521	512	353	445	323	430.8	N/A
86	522	513	354	445	322	431.2	N/A
87	523	515	355	446	323	432.4	N/A
88	525	515	356	447	322	433.0	N/A
89	526	515	357	446	322	433.2	N/A
90	526	516	359	448	322	434.2	N/A
91	528	516	359	450	322	435.0	N/A
92	530	517	362	450	322	436.2	N/A
93	531	518	362	451	323	437.0	N/A
94	532	520	363	452	322	437.8	N/A
95	534	520	366	453	322	439.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 4
Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	536	521	366	455	323	440.2	N/A
97	537	523	368	459	324	442.2	N/A
98	539	522	370	461	324	443.2	N/A
99	541	523	371	464	323	444.4	N/A
100	541	525	373	467	324	446.0	N/A
101	542	525	375	468	324	446.8	N/A
102	543	525	376	468	324	447.2	N/A
103	543	525	378	466	324	447.2	N/A
104	544	525	379	465	324	447.4	N/A
105	544	524	380	462	325	447.0	N/A
106	544	525	382	459	326	447.2	N/A
107	542	524	383	456	325	446.0	N/A
108	542	523	384	453	325	445.4	N/A
109	541	522	384	449	326	444.4	N/A
110	541	522	385	446	326	444.0	N/A
111	540	522	386	443	326	443.4	N/A
112	540	521	386	440	327	442.8	N/A
113	540	520	388	435	327	442.0	N/A
114	539	519	387	430	327	440.4	N/A
115	538	518	387	424	327	438.8	N/A
116	536	516	389	418	327	437.2	N/A
117	535	515	388	412	327	435.4	N/A
118	533	513	388	407	328	433.8	N/A
119	531	511	387	400	327	431.2	N/A
120	529	509	387	393	327	429.0	N/A
121	528	507	386	387	329	427.4	N/A
122	524	505	385	381	328	424.6	N/A
123	523	504	384	375	328	422.8	N/A
124	520	503	383	369	328	420.6	N/A
125	518	500	382	363	328	418.2	N/A
126	515	498	380	358	328	415.8	N/A
127	513	497	379	354	330	414.6	N/A
128	512	495	377	350	330	412.8	N/A
129	510	495	376	345	329	411.0	N/A
130	509	493	374	341	329	409.2	N/A
131	508	491	373	339	330	408.2	N/A
132	507	490	371	334	330	406.4	N/A
133	507	489	370	332	330	405.6	N/A
134	507	488	368	331	330	404.8	N/A
135	507	487	367	328	330	403.8	N/A
136	506	486	367	327	332	403.6	N/A
137	505	485	365	322	331	401.6	N/A
138	504	485	364	320	331	400.8	N/A
139	502	483	363	319	331	399.6	N/A
140	500	482	363	316	331	398.4	N/A
141	497	481	362	312	331	396.6	N/A
142	494	480	360	310	331	395.0	N/A
143	491	479	358	308	331	393.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	489	478	358	305	331	392.2	N/A
145	485	477	356	302	331	390.2	N/A
146	483	476	355	300	332	389.2	N/A
147	480	476	354	298	332	388.0	N/A
148	477	474	353	295	331	386.0	N/A
149	475	471	352	293	330	384.2	N/A
150	471	469	350	290	330	382.0	N/A
151	468	468	349	287	331	380.6	N/A
152	463	465	347	284	330	377.8	N/A
153	460	462	346	282	329	375.8	N/A
154	456	460	343	279	329	373.4	N/A
155	452	459	342	276	329	371.6	N/A
156	448	456	340	274	329	369.4	N/A
157	445	452	338	271	330	367.2	N/A
158	442	450	336	269	327	364.8	N/A
159	439	448	334	267	327	363.0	N/A
160	436	446	332	264	327	361.0	N/A
161	433	443	331	260	327	358.8	N/A
162	429	441	329	259	326	356.8	N/A
163	427	440	328	258	326	355.8	N/A
164	424	436	328	254	325	353.4	N/A
165	422	435	324	252	324	351.4	N/A
166	420	433	322	250	324	349.8	N/A
167	417	431	321	247	324	348.0	N/A
168	415	429	320	245	324	346.6	N/A
169	414	427	318	244	325	345.6	N/A
170	411	425	317	242	323	343.6	N/A
171	409	424	315	242	323	342.6	N/A
172	408	423	314	240	323	341.6	N/A
173	406	421	314	238	323	340.4	N/A
174	404	419	312	236	322	338.6	N/A
175	402	419	310	236	322	337.8	N/A
176	401	418	309	234	322	336.8	N/A
177	400	416	308	233	321	335.6	N/A
178	399	414	308	231	321	334.6	N/A
179	397	413	306	231	320	333.4	N/A
180	396	412	306	229	320	332.6	N/A
181	395	413	304	229	320	332.2	N/A
182	394	411	303	227	320	331.0	N/A
183	392	408	302	226	320	329.6	N/A
184	391	408	301	225	319	328.8	N/A
185	390	407	300	225	319	328.2	N/A
186	389	406	301	224	319	327.8	N/A
187	388	404	299	223	318	326.4	N/A
188	387	403	298	222	318	325.6	N/A
189	386	402	297	221	317	324.6	N/A
190	385	401	296	220	317	323.8	N/A
191	383	400	295	220	317	323.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	383	398	295	219	318	322.6	N/A
193	382	397	294	218	316	321.4	N/A
194	380	397	293	217	316	320.6	N/A
195	379	396	292	216	316	319.8	N/A
196	379	394	292	215	315	319.0	N/A
197	378	394	291	216	315	318.8	N/A
198	376	393	291	214	316	318.0	N/A
199	377	392	291	214	314	317.6	N/A
200	375	391	289	212	314	316.2	N/A
201	374	392	288	212	313	315.8	N/A
202	374	390	288	212	313	315.4	N/A
203	373	389	288	211	312	314.6	N/A
204	372	389	288	211	312	314.4	N/A
205	371	388	287	209	311	313.2	N/A
206	370	387	286	208	311	312.4	N/A
207	369	386	286	208	311	312.0	N/A
208	368	386	285	208	310	311.4	N/A
209	367	385	285	206	310	310.6	N/A
210	366	385	285	206	309	310.2	N/A
211	366	384	284	206	309	309.8	N/A
212	365	384	284	206	308	309.4	N/A
213	365	383	283	205	308	308.8	N/A
214	364	382	282	204	308	308.0	N/A
215	363	382	282	204	309	308.0	N/A
216	363	380	281	204	307	307.0	N/A
217	362	380	281	202	307	306.4	N/A
218	362	380	281	203	306	306.4	N/A
219	362	378	280	202	306	305.6	N/A
220	362	378	280	202	305	305.4	N/A
221	361	377	279	201	305	304.6	N/A
222	359	375	279	200	305	303.6	N/A
223	359	375	279	200	304	303.4	N/A
224	358	374	278	200	304	302.8	N/A
225	358	373	278	200	304	302.6	N/A
226	357	372	277	199	303	301.6	N/A
227	357	372	278	198	303	301.6	N/A
228	356	371	276	198	303	300.8	N/A
229	355	370	277	197	302	300.2	N/A
230	356	369	276	198	302	300.2	N/A
231	354	369	275	197	302	299.4	N/A
232	354	368	276	197	302	299.4	N/A
233	354	367	275	197	301	298.8	N/A
234	353	367	274	196	301	298.2	N/A
235	353	366	274	196	301	298.0	N/A
236	352	366	274	195	300	297.4	N/A
237	352	366	273	194	301	297.2	N/A
238	351	365	274	194	300	296.8	N/A
239	350	364	273	194	300	296.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	350	363	272	195	299	295.8	N/A
241	350	363	273	194	299	295.8	N/A
242	349	363	272	194	299	295.4	N/A
243	348	363	272	194	299	295.2	N/A
244	348	363	271	194	299	295.0	N/A
245	348	361	271	192	299	294.2	N/A
246	347	361	272	191	297	293.6	N/A
247	347	360	271	191	298	293.4	N/A
248	347	360	271	192	297	293.4	N/A
249	345	360	271	190	297	292.6	N/A
250	345	360	271	191	296	292.6	N/A
251	345	359	270	191	296	292.2	N/A
252	345	359	272	190	296	292.4	N/A
253	344	359	270	189	296	291.6	N/A
254	343	359	271	189	295	291.4	N/A
255	343	358	270	189	295	291.0	N/A
256	343	358	270	189	294	290.8	N/A
257	342	357	270	189	296	290.8	N/A
258	342	358	270	188	294	290.4	N/A
259	342	357	271	188	294	290.4	N/A
260	341	357	270	188	293	289.8	N/A
261	341	356	270	187	293	289.4	N/A
262	341	356	270	186	293	289.2	N/A
263	340	358	270	186	293	289.4	N/A
264	340	356	269	187	294	289.2	N/A
265	340	356	270	187	293	289.2	N/A
266	339	356	270	187	292	288.8	N/A
267	340	355	270	187	292	288.8	N/A
268	339	355	270	187	292	288.6	N/A
269	339	355	270	187	292	288.6	N/A
270	338	355	270	187	291	288.2	N/A
271	339	355	270	186	291	288.2	N/A
272	339	355	271	185	291	288.2	N/A
273	338	355	271	185	290	287.8	N/A
274	338	355	271	185	290	287.8	N/A
275	339	355	271	185	291	288.2	N/A
276	339	355	271	185	290	288.0	N/A
277	338	355	272	185	290	288.0	N/A
278	337	354	272	185	290	287.6	N/A
279	338	354	272	184	289	287.4	N/A
280	337	354	273	184	289	287.4	N/A
281	337	354	273	184	289	287.4	N/A
282	338	355	274	184	290	288.2	N/A
283	337	354	273	183	289	287.2	N/A
284	337	354	274	183	288	287.2	N/A
285	338	354	274	182	288	287.2	N/A
286	338	354	275	183	289	287.8	N/A
287	338	355	275	182	289	287.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	338	354	275	183	289	287.8	N/A
289	338	354	275	182	289	287.6	N/A
290	338	354	276	182	288	287.6	N/A
291	338	355	276	183	287	287.8	N/A
292	338	356	277	182	287	288.0	N/A
293	338	355	276	182	287	287.6	N/A
294	338	355	276	184	287	288.0	N/A
295	338	355	277	183	287	288.0	N/A
296	338	357	277	182	287	288.2	N/A
297	340	357	277	181	287	288.4	N/A
298	339	356	277	180	288	288.0	N/A
299	339	356	277	181	286	287.8	N/A
300	339	356	276	181	286	287.6	N/A
301	339	356	276	181	287	287.8	N/A
302	339	356	276	180	286	287.4	N/A
303	339	356	276	181	286	287.6	N/A
304	339	356	276	180	286	287.4	N/A
305	339	356	275	180	285	287.0	N/A
306	339	356	275	180	286	287.2	N/A
307	339	355	275	180	286	287.0	N/A
308	339	355	274	180	285	286.6	N/A
309	339	355	275	179	285	286.6	N/A
310	340	355	274	179	285	286.6	N/A
311	339	354	274	178	285	286.0	N/A
312	340	354	273	178	284	285.8	N/A
313	340	355	272	178	284	285.8	N/A
314	341	355	272	177	285	286.0	N/A
315	340	354	272	177	284	285.4	N/A
316	340	354	271	177	284	285.2	N/A
317	341	354	271	177	284	285.4	N/A
318	341	354	270	176	284	285.0	N/A
319	341	353	270	176	284	284.8	N/A
320	341	353	269	176	283	284.4	N/A
321	341	353	270	176	283	284.6	N/A
322	342	352	269	176	283	284.4	N/A
323	342	352	268	176	283	284.2	N/A
324	342	353	268	175	282	284.0	N/A
325	342	352	268	175	283	284.0	N/A
326	342	351	267	175	282	283.4	N/A
327	342	351	266	175	282	283.2	N/A
328	341	350	266	175	281	282.6	N/A
329	342	350	267	174	281	282.8	N/A
330	341	349	265	174	281	282.0	N/A
331	342	349	265	173	281	282.0	N/A
332	341	349	265	174	281	282.0	N/A
333	341	348	265	173	280	281.4	N/A
334	342	348	265	174	281	282.0	N/A
335	341	347	263	173	280	280.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 4
Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	341	347	263	173	279	280.6	N/A
337	341	346	263	173	279	280.4	N/A
338	340	345	262	173	279	279.8	N/A
339	340	346	262	172	279	279.8	N/A
340	340	345	262	173	279	279.8	N/A
341	340	346	262	172	279	279.8	N/A
342	339	345	262	171	278	279.0	N/A
343	339	345	261	171	278	278.8	N/A
344	339	345	262	171	279	279.2	N/A
345	339	345	261	171	278	278.8	N/A
346	338	345	260	170	277	278.0	N/A
347	339	344	260	170	277	278.0	N/A
348	339	343	262	170	277	278.2	N/A
349	338	343	260	170	277	277.6	N/A
350	338	343	260	170	276	277.4	N/A
351	338	344	259	170	277	277.6	N/A
352	337	343	259	170	276	277.0	N/A
353	337	344	259	170	276	277.2	N/A
354	338	343	259	170	275	277.0	N/A
355	337	343	258	170	276	276.8	N/A
356	338	343	258	169	275	276.6	N/A
357	337	344	258	169	275	276.6	N/A
358	336	343	258	168	275	276.0	N/A
359	337	343	258	169	274	276.2	N/A
360	336	343	258	168	275	276.0	N/A
361	337	343	257	168	274	275.8	N/A
362	337	343	257	168	274	275.8	N/A
363	336	343	257	168	274	275.6	N/A
364	335	343	257	168	274	275.4	N/A
365	335	343	256	168	273	275.0	N/A
366	336	342	256	168	273	275.0	N/A
367	335	342	256	169	272	274.8	N/A
368	335	342	256	167	272	274.4	N/A
369	336	342	256	167	272	274.6	N/A
370	337	342	255	167	272	274.6	N/A
371	335	342	256	167	272	274.4	N/A
372	335	342	256	167	272	274.4	N/A
373	335	342	255	166	272	274.0	N/A
374	335	342	255	167	271	274.0	N/A
375	335	342	255	166	271	273.8	N/A
376	335	341	254	166	271	273.4	N/A
377	335	341	254	166	271	273.4	N/A
378	335	340	254	166	271	273.2	N/A
379	334	340	254	165	270	272.6	N/A
380	335	339	254	165	270	272.6	N/A
381	334	338	254	165	271	272.4	N/A
382	334	338	254	165	270	272.2	N/A
383	335	338	254	165	271	272.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 4
Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	335	337	254	165	270	272.2	N/A
385	335	337	254	166	270	272.4	N/A
386	335	337	254	166	271	272.6	N/A
387	335	335	254	165	270	271.8	N/A
388	334	334	254	165	270	271.4	N/A
389	335	333	254	165	270	271.4	N/A
390	334	333	254	164	269	270.8	N/A
391	335	333	255	164	268	271.0	N/A
392	334	331	255	163	268	270.2	N/A
393	335	332	256	163	268	270.8	N/A
394	334	331	255	163	268	270.2	N/A
395	334	331	256	163	268	270.4	N/A
396	335	329	256	164	269	270.6	N/A
397	334	329	256	163	268	270.0	N/A
398	334	329	256	163	268	270.0	N/A
399	333	328	256	163	268	269.6	N/A
400	333	327	257	163	267	269.4	N/A
401	333	328	258	163	267	269.8	N/A
402	334	326	258	163	267	269.6	N/A
403	334	327	258	163	267	269.8	N/A
404	336	327	258	165	266	270.4	N/A
405	335	327	259	163	266	270.0	N/A
406	336	327	259	164	266	270.4	N/A
407	336	327	260	164	266	270.6	N/A
408	337	328	261	165	266	271.4	N/A
409	338	329	262	165	266	272.0	N/A
410	338	329	262	166	266	272.2	N/A
411	338	331	262	167	268	273.2	N/A
412	339	332	262	169	268	274.0	N/A
413	338	331	263	169	267	273.6	N/A
414	338	331	263	169	268	273.8	N/A
415	338	332	263	170	268	274.2	N/A
416	339	332	264	169	268	274.4	N/A
417	339	333	264	171	268	275.0	N/A
418	338	333	264	171	268	274.8	N/A
419	339	334	264	172	268	275.4	N/A
420	338	334	264	173	268	275.4	N/A
421	339	335	265	174	268	276.2	N/A
422	339	335	265	176	269	276.8	N/A
423	339	336	265	176	269	277.0	N/A
424	340	337	266	178	269	278.0	N/A
425	339	337	265	178	269	277.6	N/A
426	339	337	265	178	269	277.6	N/A
427	339	338	266	180	269	278.4	N/A
428	339	338	265	180	269	278.2	N/A
429	340	339	265	181	269	278.8	N/A
430	340	339	266	181	269	279.0	N/A
431	340	340	266	182	269	279.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: FPI
Model: I2450
Run #: 4

Job #: 19-469
Tracking #: 0025
Technician: ADK
Date: 4/11/2019

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	340	341	266	183	269	279.8	N/A
433	340	341	266	183	270	280.0	N/A
434	339	342	266	183	270	280.0	N/A
435	340	341	266	182	270	279.8	N/A
436	339	341	266	183	270	279.8	N/A
437	339	342	266	182	270	279.8	N/A
438	339	342	265	182	270	279.6	N/A
439	339	342	267	182	270	280.0	N/A
440	338	342	265	183	271	279.8	N/A
441	338	341	265	182	271	279.4	N/A
442	338	341	266	183	270	279.6	N/A
443	338	341	266	182	270	279.4	N/A
444	337	341	265	182	271	279.2	N/A
445	337	341	265	181	270	278.8	N/A
446	337	341	265	181	270	278.8	N/A
447	336	341	265	181	270	278.6	N/A
448	337	341	265	181	270	278.8	N/A
449	336	342	265	181	271	279.0	N/A
450	336	342	264	181	271	278.8	N/A
451	335	341	264	182	270	278.4	N/A
452	335	340	264	182	270	278.2	N/A
453	335	340	265	181	270	278.2	N/A
454	336	340	264	182	270	278.4	N/A
455	335	340	263	181	271	278.0	N/A
456	335	340	263	182	271	278.2	N/A
457	334	340	263	181	270	277.6	N/A
458	335	339	264	180	270	277.6	N/A
459	334	340	263	181	270	277.6	N/A
460	334	340	263	181	270	277.6	N/A
461	334	339	263	180	270	277.2	N/A
462	333	339	263	180	270	277.0	N/A
463	334	339	263	180	270	277.2	N/A
464	333	340	262	180	270	277.0	N/A
465	333	340	262	181	269	277.0	N/A
466	333	338	262	180	269	276.4	N/A
467	332	338	263	179	269	276.2	N/A
468	332	338	263	179	269	276.2	N/A
469	333	338	263	179	270	276.6	N/A
470	333	338	262	179	269	276.2	N/A
471	332	337	261	179	270	275.8	N/A
Average	405	407	304	263	306	337	N/A

LAB SAMPLE DATA - ASTM E2515

Client:	FPI	Job #:	19-469
Model:	I2450	Tracking #:	0025
Run #:	4	Technician:	ADK
		Date:	4/11/2019

TRAIN A (1st Hour)

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T153/T159	178.7	175.9	2.8
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total	Total Particulate, mg:	2.8

TRAIN A (Post 1st hour)

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T152	179.1	87.8	3.2
B. Rear filter catch	Filter	T154		88.1	
C. Probe catch*	Probe	3A	116073.8	116073.6	0.2
D. O-Ring catch*	O-Ring	3A	3575.5	3575.4	0.1

Sub-Total	Total Particulate, mg:	3.5
Train A Aggregate	Total Particulate, mg:	**6.3**

TRAIN B

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	T155, T158, T160	355.9	263.4	5.0
B. Rear filter catch	Filter	T156		87.5	
C. Probe catch*	Probe	3B	116340.5	116340.3	0.2
D. O-Ring catch*	O-Ring	3B	3564.0	3563.9	0.1

Total Particulate, mg:	**5.3**

AMBIENT

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	T157	87.8	87.6	0.2

Total Particulate, mg:	**0.2**

*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight.

ASTM E3053 Wood Heater Run Sheets

Client: FPI | Job Number: 19-469 | Tracking #: 0025
Model: I2450 | Run Number: 2 | Test Date: 4/9/2019

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 09:30
Air Control Setting: Fully Open

Time	Notes
0:00	Started PB with 1.8 lb, torch for 20 sec
2:40	Closed door (1.1 lb)
5:00	Loaded 2.5 lb of kindling & startup (@ 0.5 lb)
19:00	Loaded remaining 2.4 lb of startup (@ 0.9 lb)
24:00	Leveled coal bed (2.2 lb)
25:00	Loaded high burn fuel
98:00	Leveled coal bed (6.2 lb)
132:00	End PB

Test Notes
Test Burn Start Time: 11:27
Air Control Setting: Open to med marking

Time	Notes
1:00	Fuel loaded, door closed
8:00	Air set halfway to test setting
11:00	Air set
17:00	Changed filter A
18:00	Changed filter B
30:00	Fan on
60:00	Changed filter A
68:00	Changed filter B
400:00	Stirred coals – 20 sec – see photos

Test Burn End Time: 19:18

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 16.93 CO (%): 4.33
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	10:07	10:12	10:10	19:27	19:30	19:31
CO_2	0.00	10.00	16.93	0.01	9.84	16.74
CO	0.000	2.484	4.330	0.013	2.419	4.117

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

Technician Signature: [signature] Date: 4/19/2019

ASTM E3053 Wood Heater Run Sheets

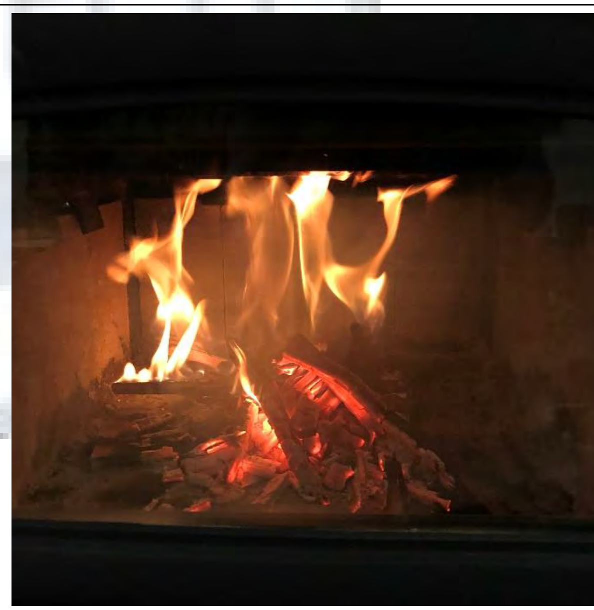
Client: FPI | Job Number: 19-469 | Tracking #: 0025
Model: I2450 | Run Number: 2 | Test Date: 4/9/2019

Test Photos

Kindling Fuel Load

Start-up Fuel Load

High Fire Fuel Load

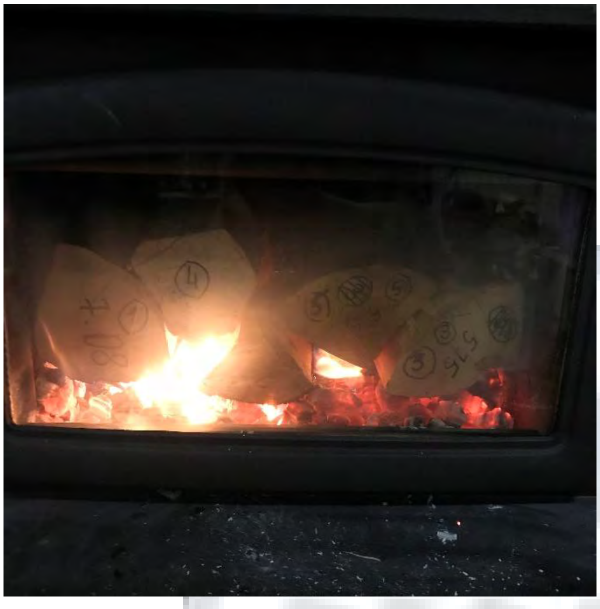


Residual Start-up Fuel Coal Bed

Technician Signature: ______________ Date: 4/19/2019

ASTM E3053 Wood Heater Run Sheets

Client: FPI
Job Number: 19-469
Tracking #: 0025
Model: I2450
Run Number: 2
Test Date: 4/9/2019



High Fire Fuel Loaded

Med Fire Fuel Load

Med Fire Fuel Loaded

Med Fire Stirred

Technician Signature: [signature]

Date: 4/19/2019

Sample Pre-Test Tare Sheet: ☐ Probes ☒ TX40 Filters ☐ O-Rings

Date/Time In Desiccator: 2/22 - 16:00 Balance ID#: 107 Audit Weight ID# / Weight(mg): 109A-100mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
T121	2/27 - 16:00	87.6	2/28 - 6:30	87.6	-	-	-	-	SB	19.460 #3
T122		88.4		88.5	-	-	-	-	SB	
T123		87.3		87.4	-	-	-	-	SB	
T124		87.5		87.3	-	-	-	-	SB	
T125		87.1		87.1	-	-	-	-	SB	
T126		87.8		87.9	-	-	-	-	SB	
T127		88.9		88.8	-	-	-	-	SB	
T128		88.9		88.8	-	-	-	-	SB	
T129		88.5		88.6	-	-	-	-	SB	19.469 #1
T130		89.7		89.6	-	-	-	-	SB	
T131		88.8		88.9	-	-	-	-	SB	
T132		88.2		88.3	-	-	-	-	SB	
T133		87.5		87.6	-	-	-	-	SB	
T134		86.7		86.7	-	-	-	-	SB	
T135	4/3 - 10:00	87.8	4/4 - 15:30	87.8	-	-	-	-	SB	
T136		87.6		87.6	-	-	-	-	SB	19.469 ~~#~~2
T137		87.5		87.5	-	-	-	-	SB	
T138		87.3		87.3	-	-	-	-	SB	
T139		87.1		87.1	-	-	-	-	SB	
T140		84.7		84.9	-	-	-	-	SB	
T141		86.7		86.6	-	-	-	-	SB	
T142		86.8		86.9	-	-	-	-	SB	
T143		86.6		86.5	-	-	-	-	SB	
T144		87.1		87.1	-	-	-	-	SB	19-469 #3
T145		86.3		86.3	-	-	-	-	SB	
T146		86.7		86.7	-	-	-	-	SB	
T147		86.3		86.4	-	-	-	-	SB	
T148		87.4		87.5	-	-	-	-	SB	
T149		86.3		86.5	-	-	-	-	SB	
T150		85.9		85.7	-	-	-	-	SB	

Sample Post-Test Analysis Sheet: ☐ Probes ☒ TX40 Filters ☐ O-Rings

Balance ID#: 107 Audit Weight ID# / Weight (mg): 109A-100mg

Sample ID	Tare (mg)	Date/ Time in Desiccator	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Tech. Initials
T121	87.6	3/1 - 10:30	3/4 - 8:00		3/5-8:00		-	-	-	-	SB
T122	88.3			180.8		180.7	-	-	-	-	SB
T123	87.4			180.0		177.9	-	-	-	-	SB
T124	87.3						-	-	-	-	SB
T125	87.1			269.2		269.3	-	-	-	-	SB
T126	87.9			88.0		88.0	-	-	-	-	SB
T127	88.8			* weighed as a pair with T127*							SB
T128	88.8			* weighed as a pair with T123 *							SB
T129	88.6	4/8/19	4/10 0800	93.0	4/12/19	92.9	-	-	-	-	A
T130	89.6			183.5	4/12/19	183.3	-	-	-	-	A
T131	88.9			-		Weighed with T130		-	-	-	A
T132	89.3			~~87.4~~ 272.1		272.0	-	-	-	-	A
T133	87.6			~~87.8~~ 87.8		Weighed with T132		-	-	-	A
T134	86.7			86.8		86.8	-	-	-	-	A
T135	87.8		4/15 1030	-	4/16/19 0830	Weighed with T132		-	-	-	A
T136	87.6	4/9/19		178.2		178.1	-	-	-	-	A
T137	87.5					Weighed with T136		-	-	-	A
T138	87.3			175.0		175.0	-	-	-	-	A
T139	87.1			262.0		262.0	-	-	-	-	A
T140	84.9					Weighed with T139			-	-	A
T141	86.6			~~87.0~~		~~87.0~~ Weighed with T139			-	-	A
T142	86.9			87.0		87.0	-	-	-	-	A
T143	86.5					Weighed with T138		-	-	-	A
T144	87.1	-	-	-	-	-	-	-	-	-	SB
T145	86.3	-	-	-	-	-	-	-	-	-	SB
T146	86.7	-	-	-	-	-	-	-	-	-	SB
T147	86.4	-	-	-	-	-	-	-	-	-	SB
T148	87.5	-	-	-	-	-	-	-	-	-	SB
T149	86.5	-	-	-	-	-	-	-	-	-	SB
T150	85.7	-	-	-	-	-	-	-	-	-	SB

Sample Pre-Test Tare Sheet: ☐ Probes ☒ TX40 Filters ☐ O-Rings

Date/Time In Desiccator: 3/7/19 - 13:00 Balance ID#: 107 Audit Weight ID# / Weight(mg): 109A-100mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
T151	4/4-15:30	88.8	4/5-8:00	89.0	-	-	-	-	SB	
T152		87.9		87.8	-	-	-	-	SB	419-469 #4
T153		88.3		88.3	-	-	-	-	SB	
T154		88.1		88.1	-	-	-	-	SB	
T155		88.0		88.0	-	-	-	-	SB	
T156		87.5		87.5	-	-	-	-	SB	
T157		87.5		87.6	-	-	-	-	SB	
T158		87.4		87.6	-	-	-	-	SB	
T159		87.5		87.6	-	-	-	-	SB	
T160		87.9		87.8	-	-	-	-	SB	
T161		88.6		88.6	-	-	-	-	SB	
T162		88.1		87.9	-	-	-	-	SB	
T163		88.4		88.5	-	-	-	-	SB	
T164		88.9		88.9	-	-	-	-	SB	
T165		88.3		88.2	-	-	-	-	SB	
T166		88.6		88.5	-	-	-	-	SB	
T167		87.8		87.6	-	-	-	-	SB	
T168		88.5		88.5	-	-	-	-	SB	
T169		88.3		88.4	-	-	-	-	SB	
T170		87.8		88.0	-	-	-	-	SB	
T171		88.2		88.2	-	-	-	-	SB	
T172		88.2		88.2	-	-	-	-	SB	
T173		88.5		88.5	-	-	-	-	SB	
T174		87.6		87.7	-	-	-	-	SB	
T175		88.3		88.4	-	-	-	-	SB	
T176		88.3		88.4	-	-	-	-	SB	
T177		87.9		87.8	-	-	-	-	SB	
T178		87.5		87.5	-	-	-	-	SB	
T179		87.9		88.0	-	-	-	-	SB	
T180		87.4		87.4	-	-	-	-	SB	

Sample Post-Test Analysis Sheet: ☐ Probes ☒ TX40 Filters ☐ O-Rings

Balance ID#: 107 Audit Weight ID# / Weight (mg): 109A-100mg

Sample ID	Tare (mg)	Date/ Time in Desiccator	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Tech. Initials
T151	89.0	-	~~4/15/04~~	-	-	-	-	-	-	-	SR
T152	87.8		4/15 10:30	178.8	4/16/19 0830	178.7	-	-	-	-	A
T153	88.3			179.2		179.1	-	-	-	-	A
T154	88.1			Weighed with T152		-	-	-	-	-	A
T155	86.0			356.0	4/16 0830	355.9	-	-	-	-	A
T156	87.5			Weighed with T155		-	-	-	-	-	A
T157	87.6			87.8	4/16 0830	87.8	-	-	-	-	A
T158	97.6			Weighed with T155		-	-	-	-	-	A
T159	87.6			Weighed with T153		-	-	-	-	-	A
T160	87.8			Weighed with T155		-	-	-	-	-	A
T161											
T162											
T163											
T164											
T165											
T166											
T167											
T168											
T169											
T170											
T171											
T172											
T173											
T174											
T175											
T176											
T177											
T178											
T179											
T180											

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

Date/Time In Desiccator: 1/17/2019 - 8:00 Balance ID#: 107 Audit Weight ID# / Weight(mg): 109B-200mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
1A	1/24 - 10:00	3562.0	1/24 - 16:30	3562.0	-	-	-	-	SB	18-447 #1
1B		3550.9		3550.8	-	-	-	-	SB	18-447 #1
2A		3548.0		3547.9	-	-	-	-	SB	18-447 #2
2B		3566.4		3566.5	-	-	-	-	SB	18-447 #2
3A		3575.4		3575.2	-	-	-	-	SB	18-447 #3
3B		3563.8		3563.8	-	-	-	-	SB	18-447 #3
4A		3588.8	2/1 - 8:45	3588.4	2/2 - 7:30	3588.3	-	-	SB	18-439 #1
4B		3576.4	2/1 - 8:45	3575.7	2/2 - 7:30	3575.7	-	-	SB	18-439 #1
5A	2/20 - 17:00	3529.7	2/21 - 13:00	3529.7	-	-	-	-	SB	19-460 #Ass.1
5B		3526.4		3526.3	-	-	-	-	SB	19-460 #Ass.1
6A		3610.3		3610.2	-	-	-	-	SB	19-460 #Ass.2
6B		3379.9		3380.0	-	-	-	-	SB	19-460 #Ass.2
7A		3569.0		3569.1	-	-	-	-	SB	19-460 #1
7B		3517.8		3517.8	-	-	-	-	SB	19-460 #1
8A	2/26 - 15:00	3547.0	2/27 - 7:00	3547.0	-	-	-	-	SB	19-460 #2
8B		3580.2		3580.3	-	-	-	-	SB	19-460 #2
9A		3577.1		3577.1	-	-	-	-	SB	19-460 #3
9B		3520.0		3519.9	-	-	-	-	SB	19-460 #3
10A	3/25/19 12:00	3413.9	3/26 - 12:00	3414.1	-	-	-	-	SB	19-470 #1
10B	3/25 - 12:00	3565.7	3/26 12:00	3565.8	-	-	-	-	SB	19-470 #1
11A	4/3 - 10:00	3408.2	4/4 - 15:30	3408.7	4/8 - 6:30	3409.4	4/9 - 6:00	3409.3	SB	19-468 #1
11B		4219.9		4220.7		4221.0		4220.9	SB	19-468 #1
12A		3415.9		3416.5		3416.9		3417.0	SB	19-468 #2
12B		3388.6		3388.9		3389.4		3381.5	SB	19-468 #2
13A		3443.5		3444.0		3444.3		3444.4	SB	19-468 #3
13B		3483.5		3484.0		3484.4		3485.5	SB	19-468 #3
14A		3360.1		3360.2	-	-	-	-	SB	19-469 #1
14B		3334.7		3334.6	-	-	-	-	SB	↓
15A		3565.7		3565.5	-	-	-	-	SB	19-468 #2
15B		3566.3		3565.9	4/5 - 8:00	3566.1	-	-	SB	↓

Sample Post-Test Analysis Sheet: ☐ Probes ☐ Filters ☒ O-Rings

Balance ID#: 107 Audit Weight ID# / Weight (mg): 109B-200mg

Sample ID	Tare (mg)	Date/ Time in Desiccator	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Tech. Initials
1A	3562.0	1/28 - 15:10	1/30 - 7:30	3562.3	1/31 - 8:00	3562.0	2/1 - 8:45	3562.0	-	-	SB
1B	3550.8	1/28 - 15:10	1/30 - 7:30	3551.1	1/31 - 8:00	3550.9	-	-	-	-	SB
2A	3547.9	1/30 - 8:00	1/31 - 8:00	3548.5	2/1 - 8:45	3548.2	2/2 - 7:30	3548.2	-	-	SB
2B	3566.5	1/30 - 8:00	1/31 - 8:00	3566.8	2/1 - 8:45	3566.6	-	-	-	-	SB
3A	3575.2	1/31 - 8:30	2/1 - 8:45	3575.9	2/2 - 7:30	3575.8	-	-	-	-	SB
3B	3563.8	1/31 - 8:30	2/1 - 8:45	3564.0	2/2 - 7:30	3563.8	-	-	-	-	SB
4A	3588.3	2/4 - 15:45	2/6 - 8:30	3588.4	2/7 - 8:00	3588.4	-	-	-	-	SB
4B	3575.7	2/4 - 15:45	2/6 - 8:30	3576.1	2/7 - 8:00	3576.0	-	-	-	-	SB
5A	3529.7	2/25 - 14:00	2/27 - 13:30	3529.9	2/28 - 6:30	3530.0	-	-	-	-	SB
5B	3526.3	2/25 - 14:00	2/27 - 13:30	3527.0	2/28 - 6:30	3526.8	-	-	-	-	SB
6A	3610.2	2/27 - 7:30	3/1 - 10:00	3611.0	3/4 - 8:00	3610.9	-	-	-	-	SB
6B	3380.0	2/27 - 7:30		3380.5	3/4 - 8:00	3380.5	-	-	-	-	SB
7A	3569.1	2/27 - 12:00		3569.2	3/4 - 8:00	3569.2	-	-	-	-	SB
7B	3517.8	2/27 - 12:00		3517.9	3/4 - 8:00	3517.9	-	-	-	-	SB
8A	3547.0	2/28 - 7:00		3547.2	3/4 - 8:00	3547.2	-	-	-	-	SB
8B	3580.3	2/28 - 7:00		3581.0	3/4 8:00	3581.1	-	-	-	-	SB
9A	3577.1	3/1 - 10:30	3/4 - 8:00	3577.2	3/5 - 8:00	~~3520.1~~ 3577.2	-	-	-	-	SB
9B	3519.9	3/1 - 10:30	3/4 - 8:00	3520.0	3/5 - 8:00	3520.1	-	-	-	-	SB
10A	3414.1	3/28 - 15:20	4/1 - 8:00	3415.3	4/2 - 8:00	3415.2	-	-	-	-	SB
10B	3565.8	3/28 - 15:20	4/1 - 8:00	3565.9	4/2 - 8:00	3566.1	-	-	-	-	SB
11A	3409.3	4/13 - 10:00	4/17 - 12:30	-	4/18 - 8:00	-	-	-	-	-	SB
11B	4220.9	4/13 - 10:00		-		-	-	-	-	-	SB
12A	3417.0	4/13 - 10:00		3418.1		3418.0	-	-	-	-	SB
12B	3389.5	4/13 - 10:00		3390.6		3390.7	-	-	-	-	SB
13A	3444.4	4/13 - 10:00		3445.6		3445.6	-	-	-	-	SB
13B	3485.5	4/13 - 10:00		3486.6		3486.7	-	-	-	-	SB
14A	3360.2	4/8/19	4/10 0800	3360.6	4/15 1000	3360.6	-	-	-	-	[illegible]
14B	3334.6			3334.9		3334.9	-	-	-	-	[illegible]
15A	3565.5	~~3567.0~~	4/15/11:00	3567.0	4/16 0830	3567.0	-	-	-	-	[illegible]
15B	3566.1	4/8/19		3567.7		3567.6	-	-	-	-	[illegible]

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

Date/Time In Desiccator: 2/5/19 - 12:00 Balance ID#: 107 Audit Weight ID# / Weight(mg): 109B-200mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
1A	4/3 - 10:00	3562.3	4/4 - 15:30	3562.0	4/5 - 8:00	3562.1	-	-	SB	19-469 #3
1B		3551.0		3550.9	-	-	-	-	SB	
2A		3548.0		3548.0	-	-	-	-	SB	19-468 #4
2B		3566.3		3566.3	-	-	-	-	SB	19-468 #4
3A		3575.3		3575.4	-	-	-	-	SB	
3B		3563.7		3563.9	-	-	-	-	SB	
4A	4/8 - 6:30	3587.8								
4B		3575.9								
5A		3529.7								
5B		3526.6								
6A										
6B										
7A										
7B										
8A										
8B										
9A										
9B										
10A										
10B										
11A										
11B										
12A										
12B										
13A										
13B										
14A										
14B										
15A										
15B										

Sample Post-Test Analysis Sheet: ☐ Probes ☐ Filters ☒ O-Rings

Balance ID#: 107 Audit Weight ID# / Weight (mg): 109B-200mg

Sample ID	Tare (mg)	Date/ Time in Desiccator	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Tech. Initials
1A	3562.1		4/15 11:00	-	-	-	-	-	-	-	SB
1B	3550.9		4/15 11:00	-	-	-	-	-	-	-	SB
2A	3548.0	4/13-10:00	4/17-12:30	3549.0	4/18-8:00	3548.8	-	-	-	-	SB
2B	3566.3	4/13-10:00	4/17 12:30	3567.2	4/18-8:00	3567.1	-	-	-	-	SB
3A	3575.4	4/4/19	4/15 11:00	3575.6	4/16 0830	3575.5	-	-	-	-	[illegible]
3B	3563.9	4/4/19	4/15 11:00	3563.9	4/16 0830	3564.0	-	-	-	-	[illegible]
4A											
4B											
5A											
5B											
6A											
6B											
7A											
7B											
8A											
8B											
9A											
9B											
10A											
10B											
11A											
11B											
12A											
12B											
13A											
13B											
14A											
14B											
15A											
15B											

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

Date/Time In Desiccator: 1/17/19 - 8:00 Balance ID#: 107 Audit Weight ID# / Weight(mg): 109A/B – 100/200mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
1A	1/24 - 10:00	115627.8	1/24 - 8:00	115627.7	–	–	–	–	SB	18-447 #1
1B		115902.3		115902.3	–	–	–	–	SB	18-447 #1
2A		116239.5		116239.6	–	–	–	–	SB	18-447 #2
2B		116329.5		116329.4	–	–	–	–	SB	18-447 #2
3A		116072.9		116072.9	–	–	–	–	SB	18-447 #3
3B		116339.8		116339.7	–	–	–	–	SB	18-447 #3
4A		116182.2	2/1/19 - 8:45	116182.3	–	–	–	–	SB	18-439 #1
4B		116365.2	2/1 - 8:45	116365.3	–	–	–	–	SB	18-439 #1
5A	2/20 - 17:00	116768.2	2/21 - 13:00	116768.1	–	–	–	–	SB	19-460 #Ass.1
5B		116876.5		116876.2	2/22 - 15:30	116876.1	–	–	SB	19-460 #Ass.1
6A		116543.9		116543.8	–	–	–	–	SB	19-460 #Ass.2
6B		116117.0		116116.9	–	–	–	–	SB	19-460 #Ass.2
7A		116739.9		116739.9	–	–	–	–	SB	19-460 #1
7B		117287.7		117287.7	–	–	–	–	SB	19-460 #1
8A	2/26 - 15:00	116824.0	2/27 - 7:00	116824.1	–	–	–	–	SB	19-460 #2
8B	2/26 - 15:00	116826.3	2/27 - 7:00	116826.1	–	–	–	–	SB	19-460 #2
9A	2/26 - 15:00	116713.8	2/27 - 7:00	116713.6	–	–	–	–	SB	19-460 #3
9B	2/26 - 15:00	117135.5	2/27 - 7:00	117135.4	–	–	–	–	SB	19-460 #3
10A	3/25 - 12:00	116818.3	3/26 - 12:00	116818.4	–	–	–	–	SB	19-470 #1
10B	3/25 - 12:00	117167.1	3/26 - 12:00	117167.3	–	–	–	–	SB	19-470 #1
11A	4/3 - 10:00	117034.7	4/4 - 15:30	117034.7	–	–	–	–	SB	19-468 #1
11B		116657.8		116657.9	–	–	–	–	SB	19-468 #1
12A		116888.0		116888.1	–	–	–	–	SB	19-468 #2
12B		117051.6		117051.7	–	–	–	–	SB	19-468 #2
13A		117454.8		117455.0	–	–	–	–	SB	19-468 #3
13B		117053.5		117053.6	–	–	–	–	SB	19-468 #3
14A		116816.8		116816.8	–	–	–	–	SB	19-469 #1
14B		116770.6		116770.8	–	–	–	–	SB	↓
15A		117418.0		117417.9	–	–	–	–	SB	19-469 #2
15B		116905.0		116905.3	4/5 11:00	116905.3	–	–	SB	↓

Sample Post-Test Analysis Sheet: ☒ Probes ☐ Filters ☐ O-Rings

Balance ID#: 107 Audit Weight ID# / Weight (mg): 109A/B – 100/200mg

Sample ID	Tare (mg)	Date/ Time in Desiccator	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Tech. Initials
1A	115627.7	1/28 - 15:10	1/30 - 7:30	115628.7	1/31 - 8:00	115628.5	-	-	-	-	SB
1B	115902.3	1/28 - 15:10	1/30 - 7:30	115903.0	1/31 - 8:00	115902.8	-	-	-	-	SB
2A	116239.6	1/30 - 8:00	1/31 - 8:00	116239.8	2/1 - 8:45	116239.9	-	-	-	-	SB
2B	116329.4	1/30 - 8:00	1/31 - 8:00	116329.9	2/1 - 8:45	116330.0	-	-	-	-	SB
3A	116072.9	1/31 - 8:30	2/1 - 8:45	116073.4	2/2 - 7:30	116073.5	-	-	-	-	SB
3B	116339.7	1/31 - 8:30	2/1 - 8:45	116340.1	2/2 - 7:30	116340.1	-	-	-	-	SB
4A	116182.3	2/4 - 15:45	2/6 - 8:30	116182.4	2/7 - 8:00	116182.3	-	-	-	-	SB
4B	116365.3	2/4 - 15:45	2/6 - 8:30	116365.1	2/7 - 8:00	116365.2	-	-	-	-	SB
5A	116768.1	2/25 - 14:00	2/27 - 13:30	116768.7	2/28 - 6:30	116768.5	-	-	-	-	SB
5B	116876.1	2/25 - 14:00	2/27 - 13:30	116876.2	2/28 - 6:30	116876.2	-	-	-	-	SB
6A	116543.8	2/27 - 7:30	3/1 - 10:00	116544.4	3/4 - 8:00	116544.2	-	-	-	-	SB
6B	116116.9	2/27 - 7:30	3/1 - 10:00	116117.6	3/4 - 8:00	116117.5	-	-	-	-	SB
7A	116739.9	2/27 - 12:00	3/1 - 10:00	116740.2	3/4 - 8:00	116740.1	-	-	-	-	SB
7B	117287.7	2/27 - 12:00	3/1 - 10:00	117287.9	3/4 - 8:00	117288.0	-	-	-	-	SB
8A	116824.1	2/28 - 7:00	3/1 - 10:00	116824.3	3/4 - 8:00	116824.2	-	-	-	-	SB
8B	116826.1	2/28 - 7:00	3/1 - 10:00	116826.1	3/4 - 8:00	116826.0	-	-	-	-	SB
9A	116713.6	3/1 - 10:30	3/4 - 8:00	116713.6	3/5 - 8:00	116713.5	-	-	-	-	SB
9B	117135.4	3/1 - 10:30	3/4 - 8:00	117135.4	3/5 - 8:00	117135.2	-	-	-	-	SB
10A	116818.4	3/28 - 15:20	4/1 - 8:00	116818.6	4/2 - 8:00	116818.6	-	-	-	-	SB
10B	117167.3	3/28 - 15:20	4/1 - 8:00	117167.1	4/2 - 8:00	117167.2	-	-	-	-	SB
11A	117034.7	4/13 - 10:00	-	-	-	-	-	-	-	-	SB
11B	116657.9	4/13 - 10:00	-	-	-	-	-	-	-	-	SB
12A	116889.1	4/13 - 10:00	4/17 - 12:30	116888.8	4/18 - 8:00	116888.6	-	-	-	-	SB
12B	117051.7	4/13 - 10:00	4/17 - 12:30	117052.1	4/18 - 8:00	117052.1	-	-	-	-	SB
13A	117455.0	4/13 - 10:00	4/17 - 12:30	117455.9	4/18 - 8:00	117455.7	-	-	-	-	SB
13B	117053.6	4/13 - 10:00	4/17 - 12:30	117054.3	4/18 - 8:00	117053.9					
14A	11681~~7.1~~ 6.8	4/8/19	4/10 0800	116817.1	4/15 1030	116817.0	-	-	-	-	A
14B	11677~~1.0~~ 0.6	4/8/19	4/10 0800	116771.0	4/15 1030	116770.8	-	-	-	-	A
15A	117417.9	4/~~8~~9/19	4/15 1030	117418.1	4/18 0900	117418.1	-	-	-	-	A
15B	116905.3	4/9/19	4/15 1030	116095.5	4/18 0900	116905.4	-	-	-	-	A

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

Date/Time In Desiccator: 2/5- 12:00 Balance ID#: 107 Audit Weight ID# / Weight(mg): 109A/B – 100/200mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
1A	4/3-10:00	115628.8	4/4-15:30	115629.1	4/5-8:00	115628.9	–	–	SB	469-19 #3
1B	↓	115903.0	↓	115903.2	–	–	–	–	SB	↓
2A	↓	116239.7	↓	116240.0	4/5-8:00	116239.9	–	–	SB	19-468 #4 ~~469-19 #3~~
2B	↓	116330.1	↓	116330.2	–	–	–	–	SB	19-468 #4
3A	↓	116073.5	↓	116073.6	–	–	–	–	SB	469-19 #4
3B	↓	116340.4	↓	116340.3	–	–	–	–	SB	↓
4A										
4B										
5A										
5B										
6A										
6B										
7A										
7B										
8A										
8B										
9A										
9B										
10A										
10B										
11A										
11B										
12A										
12B										
13A										
13B										
14A										
14B										
15A										
15B										

Sample Post-Test Analysis Sheet: ☒ Probes ☐ Filters ☐ O-Rings

Balance ID#: 107 Audit Weight ID# / Weight (mg): 109A/B – 100/200mg

Sample ID	Tare (mg)	Date/ Time in Desiccator	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Tech. Initials
1A	115628.9	–	–	–	–	–	–	–	–	–	SB
1B	115903.2	–	–	–	–	–	–	–	–	–	SB
2A	116239.9	4/13 - 10:00	4/17 - 12:30	116240.9	4/18 - 8:00	116240.9	–	–	–	–	SB
2B	116330.2	4/13 - 10:00	4/17 - 12:30	116331.2	4/18 - 8:00	116331.0	–	–	–	–	SB
3A	116073.6	4/11/19	4/15 1030	116073.7	4/18 0900	116073.8	–	–	–	–	[illegible]
3B	116340.3	4/11/19	4/15 1030	116340.5	4/18 0900	116340.5	–	–	–	–	[illegible]
4A											
4B											
5A											
5B											
6A											
6B											
7A											
7B											
8A											
8B											
9A											
9B											
10A											
10B											
11A											
11B											
12A											
12B											
13A											
13B											
14A											
14B											
15A											
15B											

Sample Calculations – ASTM E3053 & E2515

Client: FPI
Model: I2450
Run: 1

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

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

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

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

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

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

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

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

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

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

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

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

m_n – Total particulate matter collected, mg

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

E_T – Total particulate emissions, g

PR - Proportional rate variation

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

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

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

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

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

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

Where,

M_{FLnwb}	=	Weight of each test fuel piece, n, in test fuel load per 8.4.1, wet basis, lb (kg)
MC_{FLn}	=	Average fuel moisture of test fuel piece, n, in test fuel load, % dry basis
n	=	individual test fuel pieces that comprise the test fuel load, as applicable.

Sample Calculation:

n	M_{FLnwb}	MC_{FLn}	$(M_{FLnwb})(100/(100 + MC_{FLn}))$		
1	3.40	21.5	3.4 (100) / (100+ 21.5)) =	2.80	
2	3.64	20.6	3.64 (100) / (100+ 20.6)) =	3.02	
3	3.57	22.4	3.57 (100) / (100+ 22.4)) =	2.92	
4	7.98	24.1	7.98 (100) / (100+ 24.1)) =	6.43	
5	3.99	21.6	3.99 (100) / (100+ 21.6)) =	3.28	
6	0.00	NA	N/A	-	
7	N/A	N/A	N/A	-	
			SUM	18.44	lbs

M_{Fldb} = **18.44** lbs

M_{Fldb} = **8.37** kg

M_{SUdb} – Weight of start-up fuel, dry basis, lb (kg)
ASTM E3053 equation (2)

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

Where,

M_{SUwb} = Total weight of start-up fuel pieces, wet basis, lb (kg)

MC_{SU} = Average fuel moisture of the piece(s) from which start-up fuel was split, % dry basis

Sample Calculation:

M_{SUwb} = 4.03

MC_{SU} = 19.8

M_{SUdb} = 4.0 (100/(100+ 19.8)

M_{SUdb} = **3.36** lbs

= **1.53** kg

M_{Kdb} - Weight of kindling, dry basis, lb (kg)
ASTM E3053 equation (3)

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

Where,

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

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

Sample calculation:

M_{Kwb} = 3.06

MC_K = 10.0

M_{Kdb} = 3.06 (100/(100+ 10.0)

M_{Kdb} = **2.78** lbs

= **1.26** kgs

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

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

Where,

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

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

Sample calculation:

M_{RSUBdb} = 2.3

M_{FLEHdb} = 2.04

M_{FREHdb} = 2.30 + 2.04

M_{FREHdb} = **4.34** lbs

= **1.97** kg

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis
ASTM E3053 equation (5)

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

Sample Calculation:

M_{Kdb} = 2.78

M_{SUdb} = 3.36

M_{FLdb} = 18.44

M_{FREHdb} = 4.34

M_{TFBHdb} = 2.78 + 3.36 + 18.44 - 4.34

= **20.25** lbs

= **9.18** kg

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

ASTM E3053 equation (6)

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

Where,

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

Sample calculation:

M_{FLdb} = 18.44

M_{FLEHdb} = 2.04

θ_{H1} = 163

$$BR_H = \frac{60\ (\ 18.44 \ - \ 2.04\ )}{163}$$

BR_H = **6.04** lb/hr

= **2.74** kg/hr

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

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

Where,

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

Sample Calculation:

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

M_{TFBdb} = N/A - N/A
= **N/A** lbs
= **N/A** kg

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

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

Where,

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

Sample Calculation:

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

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

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

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

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

Where:

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

Sample calculation:

$$Fp = \frac{17.04}{17.84} = 0.955$$

$$V_s = 0.955 \times 85.49 \times 0.99 \times 0.262 \times \left(\frac{135.6 + 460}{\left(29.86 + \frac{-0.24}{13.6}\right) \times 28.78} \right)^{1/2}$$

V_s = **17.66** ft/s

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

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

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

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

Where:

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

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 17.66 \times 0.1963 \times \frac{528}{135.6 + 460} \times \frac{29.86 + \frac{-0.24}{13.6}}{29.92}$$

Q_{sd} = **10813.7** dscf/hr

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

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

Where:

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

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 28.746 \times 1.004 \times \frac{\left(29.86 + \frac{2.25}{13.6}\right)}{(89.3 + 460)}$$

$V_{m(std)}$ = **27.830** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 28.203 \times 1 \times \frac{\left(29.86 + \frac{2.22}{13.6}\right)}{(99.6 + 460)}$$

$V_{m(std)}$ = **26.690** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 22.01 \times 0.999 \times \frac{\left(29.86 + \frac{0.00}{13.6}\right)}{(81.2 + 460)}$$

$V_{m(std)}$ = **21.405** dscf

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

$$m_n = m_p + m_f + m_g$$

Where:

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

Sample Calculation:

Using equation for Train A (first hour):

m_n = 0.0 + 4.3 + 0.0

m_n = 4.3 mg

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

m_n = 0.2 + 4.8 + 0.4

m_n = 5.4 mg

Train A aggregate:

m_n = 4.3 + 5.4
m_n = **9.7** mg

Using equation for Train B:

m_n = 0 + 8.3 + 0.3

m_n = **8.6** mg

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

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

Where:

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

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{9.7}{27.83}$$

$C_s =$ **0.00035** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{8.6}{26.69}$$

$C_s =$ **0.00032** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.1}{21.40}$$

$C_r =$ **0.000005** g/dscf

E_T – Total Particulate Emissions, g

ASTM E2515 equation (15)

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

Where:

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

Sample calculation:

For Train 1

E_T = (0.000349 - 0.000005) x 10813.7 x 190 /60

E_T = **11.78** g

For Train 2

E_T = (0.000322 - 0.000005) x 10813.7 x 190 /60

E_T = **10.87** g

Average

E = **11.32** g

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

7.5% of the average =	0.85
Train 1 difference =	0.45
Train 2 difference =	0.45

PR - Proportional Rate Variation

ASTM E2515 equation (16)

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

Where:

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

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

$$PR = \left(\frac{190 \times 0.106 \times 17.66 \times (90.0 + 460) \times (89.3 + 460)}{1 \times 28.746 \times 16.87 \times (135.6 + 460) \times (83.0 + 460)} \right) \times 100$$

PR = **68** %

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

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

Where,

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

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

Sample Calculation:

E_{TH} = 11.32

θ_{H2} = 190

$$PM_{RH} = 60(11.32 / 190)$$

PM_{RH} = **3.58** g/hr

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

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

Sample Calculation:

E_{TH} = 11.32

M_{TFBHdb} = 9.18

PM_{FH} = 11.32 / 9.18

= **1.23** g/kg

PM_R - Particulate emission rate for low or medium fire test runs, g/hr
ASTM E3053 equation (12)

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

Where,

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

Sample Calculation:

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

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

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

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned.
ASTM E3053 equation (13)

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

Sample Calculation:

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

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

Sample Calculations – ASTM E3053 & E2515

Client: FPI
Model: I2450
Run: 2

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

M_{FIdb} – Weight of test fuel load, dry basis, lb (kg)

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

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

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

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

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

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

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

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

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

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

m_n – Total particulate matter collected, mg

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

E_T – Total particulate emissions, g

PR - Proportional rate variation

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

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

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

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

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

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

Where,

M_{FLnwb}	=	Weight of each test fuel piece, n, in test fuel load per 8.4.1, wet basis, lb (kg)
MC_{FLn}	=	Average fuel moisture of test fuel piece, n, in test fuel load, % dry basis
n	=	individual test fuel pieces that comprise the test fuel load, as applicable.

Sample Calculation:

n	M_{FLnwb}	MC_{FLn}	$(M_{FLnwb})(100/(100 + MC_{FLn}))$		
1	4.10	18.7	4.1 (100) / (100+ 18.7)) =	3.45	
2	6.19	24.2	6.19 (100) / (100+ 24.2)) =	4.98	
3	4.23	21.6	4.23 (100) / (100+ 21.6)) =	3.48	
4	7.98	21.8	7.98 (100) / (100+ 21.8)) =	6.55	
5	3.31	19.5	3.31 (100) / (100+ 19.5)) =	2.77	
6	0.00	NA	N/A	-	
7	0.00		N/A	-	
			SUM	21.24	lbs

M_{Fldb} = **21.24** lbs

M_{Fldb} = **9.63** kg

M_{SUdb} – Weight of start-up fuel, dry basis, lb (kg)
ASTM E3053 equation (2)

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

Where,

M_{SUwb} = Total weight of start-up fuel pieces, wet basis, lb (kg)

MC_{SU} = Average fuel moisture of the piece(s) from which start-up fuel was split, % dry basis

Sample Calculation:

M_{SUwb} = N/A - Applicable to High Fire Tests Only

MC_{SU} = N/A - Applicable to High Fire Tests Only

M_{SUdb} = N/A (100/(100+ N/A)

M_{SUdb} = **N/A** lbs

= **N/A** kg

M_{Kdb} - Weight of kindling, dry basis, lb (kg)
ASTM E3053 equation (3)

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

Where,

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

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

Sample calculation:

M_{Kwb} = N/A - Applicable to High Fire Tests Only

MC_K = N/A - Applicable to High Fire Tests Only

M_{Kdb} = N/A (100/(100+ N/A)

M_{Kdb} = **N/A** lbs

= **N/A** kgs

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

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

Where,

M_{RSUBdb} = Weight of residual start-up fuel bed when high fire test load added, lb (kg)
M_{FLEHdb} = Weight of unburned portion of test fuel load at the end of the high fire test run, lb (kg)

Sample calculation:

M_{RSUBdb} = N/A - Applicable to High Fire Tests Only
M_{FLEHdb} = N/A - Applicable to High Fire Tests Only

M_{FREHdb} = N/A + N/A

M_{FREHdb} = **N/A** lbs
= **N/A** kg

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis
ASTM E3053 equation (5)

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

Sample Calculation:

M_{Kdb} = N/A
M_{SUdb} = N/A
M_{FLdb} = N/A
M_{FREHdb} = N/A

M_{TFBHdb} = N/A + N/A + N/A - N/A
= **N/A** lbs
= **N/A** kg

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

ASTM E3053 equation (6)

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

Where,

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

Sample calculation:

M_{FLdb} = N/A - Applicable to High Fire Tests Only
M_{FLEHdb} = N/A - Applicable to High Fire Tests Only
θ_{H1} = N/A - Applicable to High Fire Tests Only

$$BR_H = \frac{60\ (\ \text{N/A} \ - \ \text{N/A}\ )}{\text{N/A}}$$

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

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

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

Where,

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

Sample Calculation:

M_{FLdb} = 21.24
M_{FREdb} = 0.00

M_{TFBdb} = 21.24 - 0.00
= **21.24** lbs
= **9.63** kg

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

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

Where,

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

Sample Calculation:

M_{TFBdb} = 21.24
θ = 525

$$BR = \frac{60 \times 21.24}{525}$$

BR = **2.43** lb/hr
= **1.10** kg/hr

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

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

Where:

F_p	=	Adjustment factor for pitot tube center point reading = $\frac{V_{strav}}{V_{scent}}$, ASTM E2515 Equation (1)
v_{scent}	=	Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec
v_{strav}	=	Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec
k_p	=	Pitot tube constant, 85.49
C_p	=	Pitot tube coefficient: 0.99, unitless
ΔP*	=	Velocity pressure in the dilution tunnel, in H_2O
T_s	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
P_{bar}	=	Barometric pressure at test site, in. Hg
P_g	=	Static pressure of tunnel, in. $H_2$0; (in Hg = in $H_2$0/13.6)
M_s	=	**The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{16.97}{17.76} = 0.955$$

$$V_s = 0.955 \quad x \quad 85.49 \; x \quad 0.99 \quad x \quad 0.262 \quad x \left(\frac{103.0 \quad + \quad 460}{\left(30.13 \quad + \quad \frac{-0.24}{13.6} \right) x \quad 28.78} \right)^{1/2}$$

V_s = **17.06** ft/s

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

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

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

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

Where:

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

Sample calculation:

$$Q_{sd} = 3600 \text{ x } (1 - 0.02) \text{ x } 17.06 \text{ x } 0.1963 \text{ x } \frac{528}{103.0 + 460} \text{ x } \frac{30.13 + \frac{-0.24}{13.6}}{29.92}$$

Q_{sd} = **11152.5** dscf/hr

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

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

Where:

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

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 80.013 \times 1.004 \times \frac{\left(30.13 + \frac{2.29}{13.6}\right)}{(90.3 + 460)}$$

$V_{m(std)}$ = **78.023** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 78.193 \times 1 \times \frac{\left(30.13 + \frac{2.23}{13.6}\right)}{(\#\#\#\#\# + 460)}$$

$V_{m(std)}$ = **73.951** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 61.01 \times 0.999 \times \frac{\left(\underline{30.13} + \frac{0.00}{13.6}\right)}{(80.5 + 460)}$$

$V_{m(std)}$ = **59.936** dscf

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

$$m_n = m_p + m_f + m_g$$

Where:

m_p = mass of particulate matter from probe, mg

m_f = mass of particulate matter from filters, mg

m_g = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A (first hour):

$m_n =$ 0.0 + 3.0 + 0.0

$m_n =$ 3.0 mg

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

$m_n =$ 0.2 + 1.2 + 1.5

$m_n =$ 2.9 mg

Train A aggregate:

$m_n =$ 3.0 + 2.9

$m_n =$ **5.9** mg

Using equation for Train B:

$m_n =$ 0.1 + 3.4 + 1.5

$m_n =$ **5.0** mg

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

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

Where:

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

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{5.9}{78.02}$$

$C_s =$ **0.00008** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{5.0}{73.95}$$

$C_s =$ **0.00007** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.1}{59.94}$$

$C_r =$ **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 1

E_T = (0.000076 - 0.000002) x 11152.5 x 525 /60

E_T = **7.22** g

For Train 2

E_T = (0.000068 - 0.000002) x 11152.5 x 525 /60

E_T = **6.44** g

Average

E = **6.83** g

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

7.5% of the average =	0.51
Train 1 difference =	0.39
Train 2 difference =	0.39

PR - Proportional Rate Variation
ASTM E2515 equation (16)

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

Where:

θ = Total sampling time, min

θ_i = Length of recording interval, min

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

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

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

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

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

T_m = Absolute average dry gas meter temperature, ^oR

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

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

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

$$PR = \left(\frac{525 \times 0.137 \times 17.06 \times (151.0 + 460) \times (90.3 + 460)}{1 \times 80.013 \times 17.96 \times (103.0 + 460) \times (85.0 + 460)} \right) \times 100$$

PR = **94** %

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

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

Where,

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

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

Sample Calculation:

E_{TH} = N/A - Applicable to High Fire Tests Only

θ_{H2} = N/A - Applicable to High Fire Tests Only

PM_{RH} = 60(N/A / N/A)

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

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

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

Sample Calculation:

E_{TH} = N/A - Applicable to High Fire Tests Only

M_{TFBHdb} = N/A - Applicable to High Fire Tests Only

PM_{FH} = N/A / N/A

= **N/A** g/kg

PM_R - Particulate emission rate for low or medium fire test runs, g/hr
ASTM E3053 equation (12)

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

Where,

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

Sample Calculation:

E_T = 6.83
θ = 525

PM_R = 60(6.83 / 525)

PM_{RH} = **0.78** g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned.
ASTM E3053 equation (13)

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

Sample Calculation:

E_T = 6.83
M_{TFBdb} = 9.63

PM_{FH} = 6.83 / 9.63
= **0.71** g/kg


ATTENTION

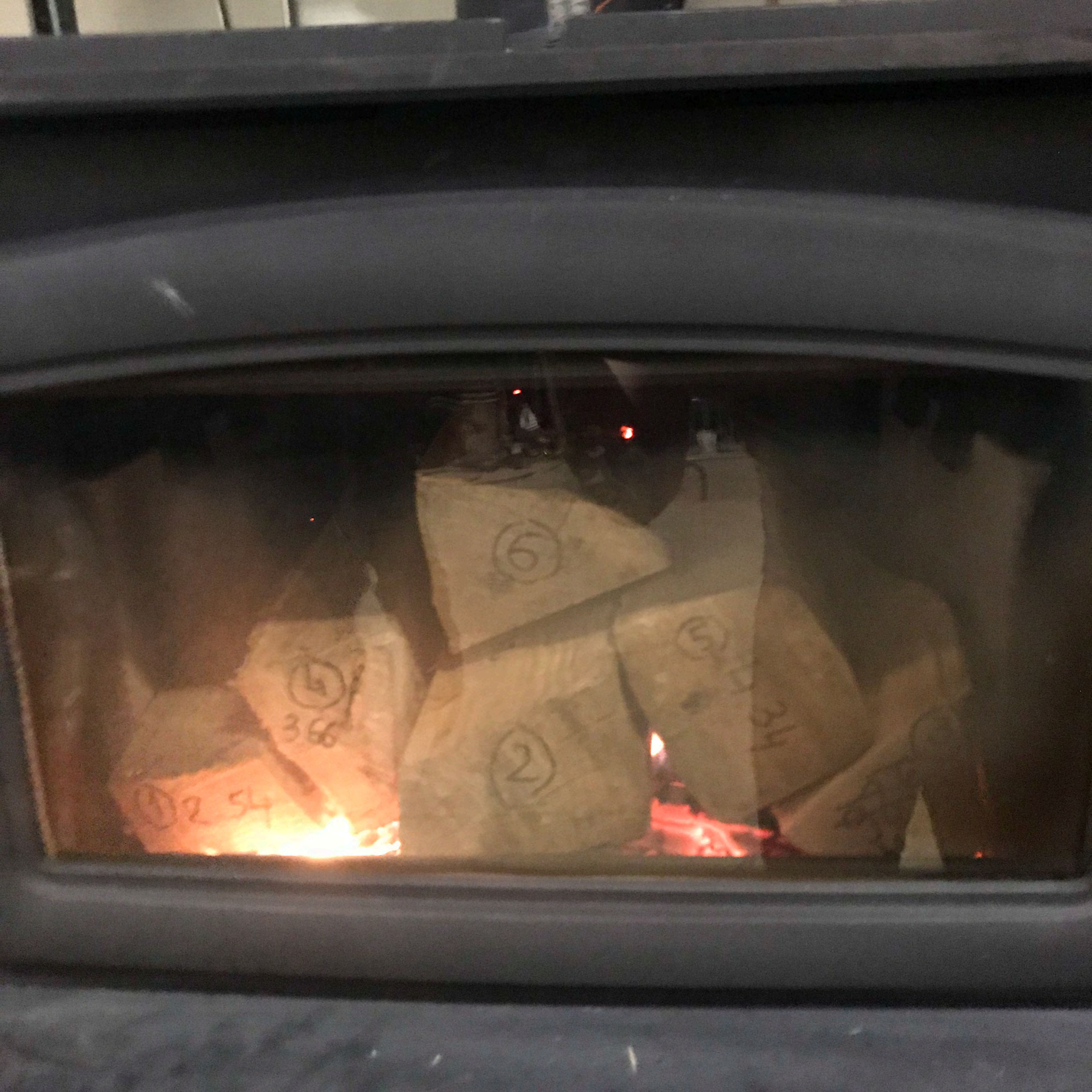

4


1
7.08
4
5


7.08
1
4
5
5
3
3

18.2
3.02
3.95


020-957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366
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5


1
2.54
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3.66
6
5
4.34
2
3


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20.2
4
5
3
3.64


1
4
2
5
3


1
4
5
5.09
3
3.92
2


1
4
4.12
2
5
3

Tested and listed to:

0219WN026S

LISTED FACTORY BUILT FIREPLACE INSERT
CERTIFIED FOR USE IN CANADA AND U.S.A.
MODEL/MODÈLE : I2450M
TESTED & LISTED BY /TESTÉ & APPROUVÉ :
ULC-S628-93 (R1997) / UL-1482 - 2011 (R2015)

DO NOT REMOVE THIS LABEL/NE PAS RETIRER CETTE ÉTIQUETTE

REGENCY® FIREPLACE PRODUCTS

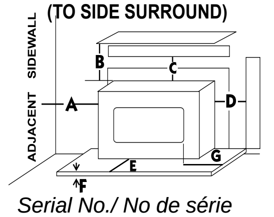
U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CORD WOOD." TESTED & LISTED TO ASTM E3053. MODEL REGENCY I24501.4 G /HR. THIS WOOD HEATER NEEDS PERIODIC INSPECTION AND REPAIR FOR PROPER OPERATION. CONSULT THE OWNER'S MANUAL FOR FURTHER INFORMATION. IT IS AGAINST FEDERAL REGULATIONS TO OPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITH THE OPERATING INSTRUCTIONS IN THE OWNER'S MANUAL. **COMPONENTS REQUIRED FOR INSTALLATION: 5.5" (140mm) or 6" (152mm) STAINLESS STEEL LINER.**
CERTIFIÉ CONFORME AUX NORMES 2020 DU U.S. ENVIRONMENTAL PROTECTION AGENCY EN MATIÈRE D'ÉMISSION DE PARTICULES DE BOIS AVEC DU BOIS DE CORDE". TESTÉ & APPROUVÉ ASTM E3053. MODÈLE REGENCY I2450 1.4 G /H. CET APPAREIL DE CHAUFFAGE AU BOIS DOIT ÊTRE INSPECTÉ PÉRIODIQUEMENT ET RÉPARÉ POUR FONCTIONNER CORRECTEMENT. CONSULTER LE MANUEL D'INSTALLATION POUR PLUS D'INFORMATION. LA RÉGLEMENTATION FÉDÉRALE INTERDIT DE FAIRE FONCTIONNER UN TEL APPAREIL SI LES CONSIGNES D'UTILISATION CONTENUES DANS LE PRÉSENT MANUEL NE SONT PAS RESPECTÉES. PIÈCES REQUISES POUR L'INSTALLATION : DOUBLURE EN ACIER INOXYDABLE DE 5,5 PO (140 mm) OU 6 PO (152 mm)

INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS. INSTALL AND USE ONLY IN MASONRY FIREPLACE OR FACTORY BUILT FIREPLACE. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA.
INSTALLER ET UTILISER SELON LES INSTRUCTIONS DU FABRICANT. INSTALLER ET UTILISER DANS UN FOYER DE MAÇONNERIE OU PRÉFABRIQUÉ.
APPELER UN INSPECTEUR EN BÂTIMENT OU LE DÉPARTEMENT INCENDIE LOCAL POUR CONNAÎTRE LES RESTRICTIONS ET LESCONDITIONS D'INSPECTION À L'INSTALLATION DANS VOTRE SECTEUR.
FLOOR THERMAL INSULATION/PROTECTION WITH A R VALUE OF 1.4 IS REQUIRED IF THE UNIT IS RAISED 0 - 2.5" (64MM) (MEASURED FROM THE BOTTOM OF THE APPLIANCE).
THERMAL FLOOR PROTECTION IS NOT REQUIRED WHEN UNIT IS RAISER GREATER THAN 2.5" (64MM) (MEASURED FROM THE BOTTOM OF THE APPLIANCE).
INSTALLER OBLIGATOIREMENT UNE ISOLATION/PROTECTION THERMIQUE D'UNE VALEUR R DE 1,4 SI L'APPAREIL EST INSTALLÉ À UNE DISTANCE INFÉRIEURE À 2.5 PO (64 MM) DU SOCLE (MESURE PRISE À PARTIR DU BAS DE L'APPAREIL).
LA PROTECTION THERMIQUE N'EST PAS REQUISE SI L'APPAREIL SE TROUVE À PLUS DE 2.5 PO (64MM) DU SOCLE (MESURE PRISE À PARTIR DU BAS DE L'APPAREIL).

920-083

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS (MEASURED FROM INSERT BODY)

ADJACENT SIDEWALL A)12 in / 305 mm
MANTEL B)14 in / 356 mm (3-1/2" MANTEL)
B)17 in / 432 mm (12" MANTEL)
TOP FACING C)14 in / 356 mm
SIDE FACING D)0.5 in / 13 mm (TO SIDE SURROUND)



Serial No./ No de série

522

OPTIONAL COMPONENT: FAN (142-917), ELECTRICAL RATING: VOLTS 115, 60 HZ, 0.6 AMPS
DANGER: RISK OF ELECTRIC SHOCK. DISCONNECT POWER BEFORE SERVICING UNIT. DO NOT ROUTE POWER CORD UNDER OR IN FRONT OF APPLIANCE. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVICING ANOTHER APPLIANCE. DO NOT REMOVE BRICKS OR MORTAR IN MASONRY FIREPLACE. FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT USE GRATE OR ELEVATE FIRE. BUILD WOOD FIRE DIRECTLY ON HEARTH. RISK OF SMOKE AND FLAME SPILLAGE, OPERATE ONLY WITH DOORS FULLY OPEN OR FULLY CLOSED. OPEN FEED DOOR TO FEED FIRE ONLY. REPLACE GLASS ONLY WITH CERAMIC GLASS (5MM). INSPECT AND CLEAN CHIMNEY FREQUENTLY. UNDER CERTAIN CONDITIONS OF USE CREOSOTE BUILDUP MAY OCCUR RAPIDLY. DO NOT OVERFIRE, IF INSERT GLOWS YOU ARE OVER-FIRING. CATALYTIC COMBUSTOR PART#021-531

PIÈCE FACULTATIVE : VENTILATEUR (142-917); PUISSANCE ÉLECTRIQUE : 115 VOLTS, 60 HZ, 0,6 A
DANGER : RISQUE D'ÉLECTROCUTION. DÉBRANCHER L'APPAREIL AVANT TOUTE RÉPARATION. NE PAS FAIRE PASSER LE FIL ÉLECTRIQUE DEVANT L'APPAREIL NI EN DESSOUS. NE PAS RELIER CET APPAREIL À UNE CHEMINÉE DESTINÉE À L'ÉVACUATION D'UN AUTRE APPAREIL. NE PAS ENLEVER DE BRIQUES NI DE MORTIER D'UNE CHEMINÉE DE MAÇONNERIE. N'UTILISER QUE DU COMBUSTIBLE DE BOIS SOLIDE. NE PAS SURÉLEVER LES BÛCHES NI LES PLACER SUR DES GRILLES, MAIS LES DÉPOSER DIRECTEMENT SUR L'ÂTRE. RISQUE DE DÉGAGEMENT DE FUMÉE OU DE FLAMMES : TOUJOURS GARDER LES PORTES COMPLÈTEMENT OUVERTES OU FERMÉES LORSQUE L'APPAREIL FONCTIONNE. DANS UNE MAISON MOBILE, TOUJOURS GARDER LES PORTES BIEN FERMÉES LORSQUE L'APPAREIL FONCTIONNE. OUVRIR LA PORTE UNIQUEMENT POUR ALIMENTER LE FEU. SI LES PORTES DU POÊLE RESTENT OUVERTES, TOUJOURS UTILISER LE PARE-ÉTINCELLES FOURNI PAR LE FABRICANT. REMPLACER LA VITRE UNIQUEMENT PAR UNE VITRE EN VITROCÉRAMIQUE (5 MM). INSPECTER ET NETTOYER FRÉQUEMMENT LA CHEMINÉE. SELON LE TYPE D'USAGE, DE LA CRÉOSOTE PEUT S'ACCUMULER RAPIDEMENT. NE PAS SURCHAUFFER; SI L'ENCASTRABLE SE MET À ROUGIR, IL SURCHAUFFE. CATALYSEUR DE POSTCOMBUSTION PIÈCE N°021-531

CAUTION / ATTENTION

HOT WHILE IN OPERATION DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. READ ABOVE INSTRUCTIONS.

SURFACES CHAUDES LORS DE FONCTIONNEMENT. NEPASTOUCHER.ÉLOIGNERLESENFANTS,LESVÊTEMENTSET LES MEUBLES. TOUT CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. LIRE LES CONSIGNES DE CET APPAREIL.

Manufactured By:
FIREPLACE PRODUCTS INTERNATIONAL LTD.
6988 VENTURE ST., DELTA, BC V4G 1H4
920-083
MADE IN CANADA

Jan Feb Mar Apr May June

SIGNATURE

DATE OF MANUFACTURE

2019
2020
2021
2022
2023

July Aug Sept Oct Nov Dec

(Duplicate Serial #) 522

Part #: **920-083**

Size: **3" H x 20-1/2" W at 100%)**

Colour: **Black on grey, except for what is indicated as being printed red on grey.**

Mar 11/19: Created decal
April 01/19: Updated decal
April 22/19: Updated decal

Tested and listed to:

0219WN026S

LISTED FACTORY BUILT FIREPLACE INSERT
CERTIFIED FOR USE IN CANADA AND U.S.A.
MODEL/MODÈLE : HI2450M
TESTED & LISTED BY /TESTÉ & APPROUVÉ :
ULC-S628-93 (R1997) / UL-1482 - 2011 (R2015)

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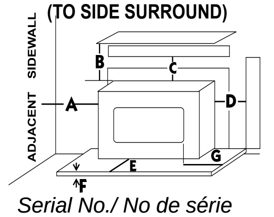
THERMAL FLOOR PROTECTION IS NOT REQUIRED WHEN UNIT IS RAISER GREATER THAN 2.5" (64MM) (MEASURED FROM THE BOTTOM OF THE APPLIANCE).
INSTALLER OBLIGATOIREMENT UNE ISOLATION/PROTECTION THERMIQUE D'UNE VALEUR R DE 2,8 SI L'APPAREIL EST INSTALLÉ À UNE DISTANCE INFÉRIEURE À 2,5 PO (64 MM) DU SOCLE (MESURE PRISE À PARTIR DU BAS DE L'APPAREIL).
LA PROTECTION THERMIQUE N'EST PAS REQUISE SI L'APPAREIL SE TROUVE À PLUS DE 2,5 PO (64 MM) DU SOCLE (MESURE PRISE À PARTIR DU BAS DE L'APPAREIL). 920-085

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS (MEASURED FROM INSERT BODY)

ADJACENT
SIDEWALL A)12 in / 305 mm
MANTEL B)14 in / 356 mm
(3-1/2" MANTEL)
B) 17 in / 432 mm (12" MANTEL)
TOP FACING C)14 in / 356 mm
SIDE FACING D)0.5 in / 13 mm
(TO SIDE SURROUND)



Serial No./ No de série

523

OPTIONAL COMPONENT: FAN (142-917), ELECTRICAL RATING: VOLTS 115, 60 HZ, 0.6 AMPS
DANGER: RISK OF ELECTRIC SHOCK. DISCONNECT POWER BEFORE SERVICING UNIT. DO NOT ROUTE POWER CORD UNDER OR IN FRONT OF APPLIANCE. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVICING ANOTHER APPLI-ANCE. DO NOT REMOVE BRICKS OR MORTAR IN MASONRY FIREPLACE. FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT USE GRATE OR ELEVATE FIRE. BUILD WOOD FIRE DIRECTLY ON HEARTH. RISK OF SMOKE AND FLAME SPILL-AGE, OPERATE ONLY WITH DOORS FULLY OPEN OR FULLY CLOSED. OPEN FEED DOOR TO FEED FIRE ONLY. RE-PLACE GLASS ONLY WITH CERAMIC GLASS (5MM). INSPECT AND CLEAN CHIMNEY FREQUENTLY. UNDER CERTAIN CONDITIONS OF USE CREOSOTE BUILDUP MAY OCCUR RAPIDLY. DO NOT OVERFIRE, IF INSERT GLOWS YOU ARE OVER-FIRING. CATALYTIC COMBUSTOR PART#021-531

PIÈCE FACULTATIVE : VENTILATEUR (142-917); PUISSANCE ÉLECTRIQUE : 115 VOLTS, 60 HZ, 0,6 A
DANGER : RISQUE D'ÉLECTROCUTION. DÉBRANCHER L'APPAREIL AVANT TOUTE RÉPARATION. NE PAS FAIRE PASSER LE FIL ÉLECTRIQUE DEVANT L'APPAREIL NI EN DESSOUS. NE PAS RELIER CET APPAREIL À UNE CHEMINÉE DESTINÉE À L'ÉVACUATION D'UN AUTRE APPAREIL. NE PAS ENLEVER DE BRIQUES NI DE MORTIER D'UNE CHEMINÉE DE MA-ÇONNERIE. N'UTILISER QUE DU COMBUSTIBLE DE BOIS SOLIDE. NE PAS SURÉLEVER LES BÛCHES NI LES PLACER SUR DES GRILLES, MAIS LES DÉPOSER DIRECTEMENT SUR L'ÂTRE. RISQUE DE DÉGAGEMENT DE FUMÉE OU DE FLAMMES : TOUJOURS GARDER LES PORTES COMPLÈTEMENT OUVERTES OU FERMÉES LORSQUE L'APPAREIL FONCTIONNE. DANS UNE MAISON MOBILE, TOUJOURS GARDER LES PORTES BIEN FERMÉES LORSQUE L'APPAREIL FONCTIONNE. OUVRIR LA PORTE UNIQUEMENT POUR ALIMENTER LE FEU. SI LES PORTES DU POÊLE RESTENT OUVERTES, TOUJOURS UTILISER LE PARE-ÉTINCELLES FOURNI PAR LE FABRICANT. REMPLACER LA VITRE UNIQUE-MENT PAR UNE VITRE EN VITROCÉRAMIQUE (5 MM). INSPECTER ET NETTOYER FRÉQUEMMENT LA CHEMINÉE. SELON LE TYPE D'USAGE, DE LA CRÉOSOTE PEUT S'ACCUMULER RAPIDEMENT. NE PAS SURCHAUFFER; SI L'ENCASTRABLE SE MET À ROUGIR, IL SURCHAUFFE. CATALYSEUR DE POSTCOMBUSTION PIÈCE N°021-531

CAUTION / ATTENTION

HOT WHILE IN OPERATION DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. READ ABOVE INSTRUCTIONS.

SURFACES CHAUDES LORS DE FONCTIONNEMENT. NE PAS TOUCHER. ÉLOIGNER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES. TOUT CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. LIRE LES CONSIGNES DE CET APPAREIL.

Manufactured By:
FIREPLACE PRODUCTS INTERNATIONAL LTD.
6988 VENTURE ST., DELTA, BC V4G 1H4
MADE IN CANADA
920-083

SIGNATURE

DATE OF MANUFACTURE

☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ June

2019 ☐
2020 ☐
2021 ☐
2022 ☐
2023 ☐

☐ July ☐ Aug ☐ Sept ☐ Oct ☐ Nov ☐ Dec

(Duplicate Serial #) 523

Part #: **920-085**

Size: **3" H x 20-1/2" W at 100%)**

Colour: **Black on grey, except for what is indicated as being printed red on grey.**

Mar 11/19: Created decal
April 22/19: Updated decal

REGENCY® FIREPLACE PRODUCTS

Classic™ I2450M Wood Fireplace Insert

Owners & Installation Manual

MODEL: I2450M

Tested & listed by:
O-TL
C US
0219WN026S

Installer: **Please complete the details on the back cover and leave this manual with the homeowner.**
Homeowner: **Please keep these instructions for future reference.**

FPI FIREPLACE PRODUCTS INTERNATIONAL LTD. 6988 Venture St., Delta, BC Canada, V4G 1H4
06.30.21

Thank you for purchasing a
REGENCY FIREPLACE PRODUCT.

The pride of workmanship that goes into each of our products will give you years of trouble-free enjoyment. Should you have any questions about your product that are not covered in this manual, please contact the **REGENCY DEALER** in your area.

“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.” Failure to follow the manual details can lead to smoke and CO emissions spilling into the home. It is recommended to have monitors in areas that are expected to generate CO such as heater fueling areas.

“U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cord wood.” Tested & listed to ASTM E3053. Model Regency I2450M 1.4 g /hr.

“This manual describes the installation and operation of the Regency I2450M wood heater. This heater meets the 2020 U.S. Environmental Protection Agency’s cord wood emission limits for wood heaters. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 14,200 Btu/hr. to 34,660 Btu/hr.” Efficiency is determined using the B415 method resulting in lower and higher heat values. This heater generates the best efficiency when operated using well-seasoned wood and installed in the main living areas where the majority of the chimney is within the building envelope. "

It is against federal regulation to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if elements are deactivated or removed."

CAUTION: BURN UNTREATED WOOD ONLY. OTHER MATERIALS SUCH AS WOOD PRESERVATIVES, METAL FOILS, COAL, PLASTIC, GARBAGE, SULPHUR OR OIL MAY DAMAGE THE HEATER.

"This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods."

DO NOT BURN:

- Treated wood
- Coal
- Garbage
- Cardboard
- Solvents
- Colored Paper
- Trash
- **Lawn clippings or yard waste**
- **Materials containing rubber including tires**
- **Materials containing plastic**
- **Waste petroleum products , paints or paint thinners or asphalt products**
- **Materials containing asbestos**
- **Construction or demolition debris**
- **Railroad ties**
- **Manure or animal remains**
- **Saltwater driftwood or other previously salt water saturated materials**
- **Unseasoned wood**
- **Paper products, cardboard, plywood or particle board. 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 a wood heater.**

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

The authority having jurisdiction (such as Municipal Building Department, Fire Department, Fire Prevention Bureau, etc.) should be consulted before installation to determine the need to obtain a permit.

This unit must be connected to either a listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the United States of America. or code approved masonry chimney with flue liner.

I2450M is tested and certified to ULC-S628-93 (R1997) and UL1482-2011 (R2015).

SAVE THESE INSTRUCTIONS

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

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

Wood Energy Technical Training

WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov

919-874

safety label

unit dimensions

installation

operating instructions

maintenance

parts list

warranty

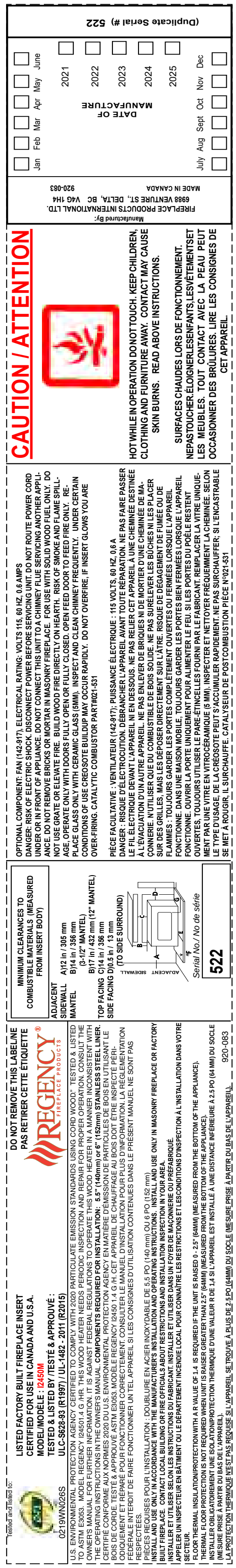
CAUTION: To avoid burns or wood splinters, when opening/closing the fuel door or adding wood to the fire, You should always wear appropriate protective gloves to protect your hands from the heat being emitted from this fireplace.

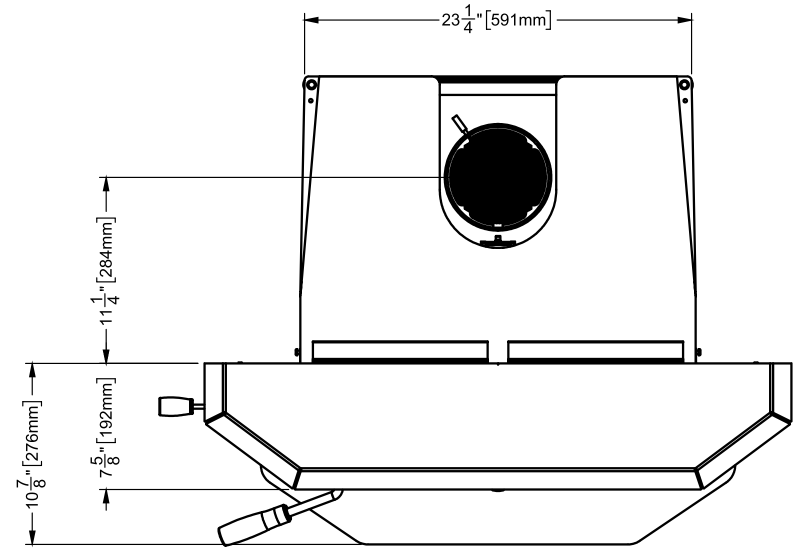
ALL PICTURES / DIAGRAMS SHOWN THROUGHOUT THIS MANUAL ARE FOR ILLUSTRATION PURPOSES ONLY. ACTUAL PRODUCT MAY VARY DUE TO PRODUCT ENHANCEMENTS.

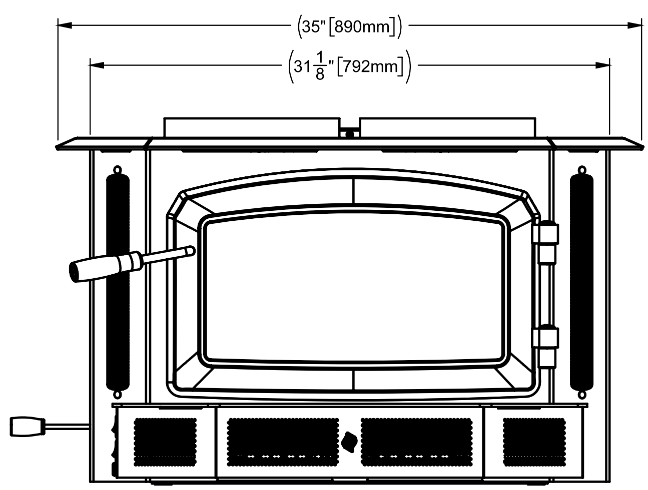
Safety Label for I2450M

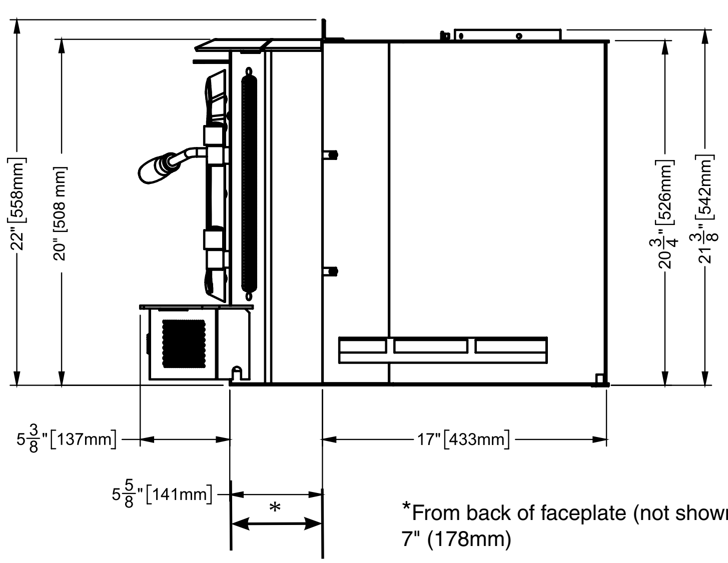
This is a copy of the label that accompanies your **Regency Insert**. We have printed a copy of the contents here for your review.

NOTE: Regency units are constantly being improved. Check the label on the unit and if there is a difference, the label on the unit is the correct one.









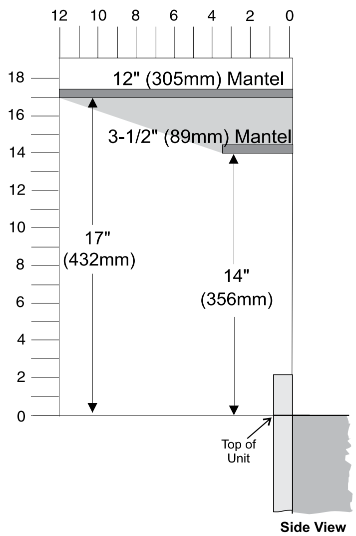
*From back of faceplate (not shown) to fuel door opening
7" (178mm)

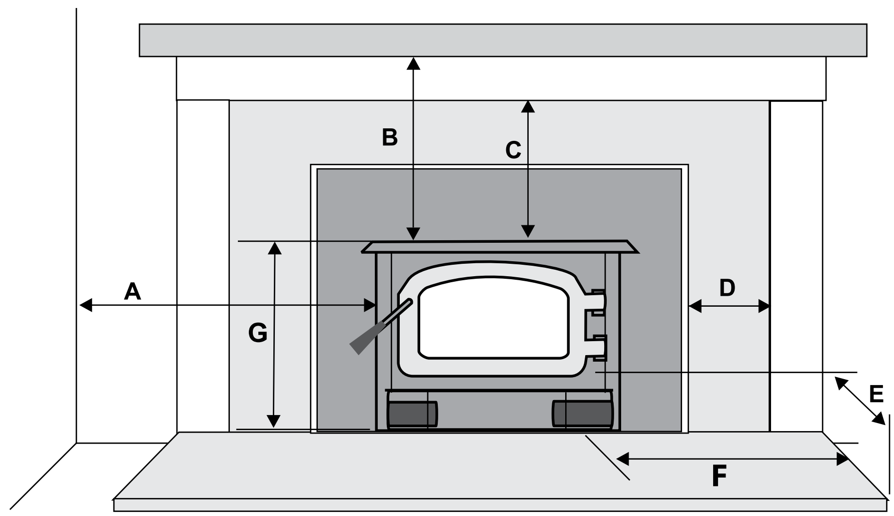
Masonry And Factory Built Fireplace Clearances

The minimum required clearances to combustible materials when installed into a masonry or factory built fireplace are listed below.

Unit I2450M	Adjacent Side Wall (to Side) A	Mantle ** (to Top of Unit) B	Top Facing (to Top of Unit) C	Side Facing D	Minimum Hearth Extension* E	Minimum Hearth Side Extension* F	To Top of Unit G
	12" (305mm)	14"(356mm) for 3-1/2" (89mm) mantel	14" (356mm)	1/2"(13mm) to side surround	16" (406mm) USA	8" (203mm)	20" (508mm)
		17"(432mm) for 12" (305mm) mantel			18"(457mm) Canada		

Side and Top facing is a maximum of 1-1/2" (38mm) thick.
Note: If there is only a top facing and no side facing, refer to (B) mantle (to top of unit) clearance requirements.





Clearance diagram for installations

CLEARANCES ARE CRITICAL

****Mantel can be installed anywhere in shaded area or higher using the above scale.

Note: Ensure the paint that is used on the mantel and the facing is "heat resistant" or the paint may discolour.

*Floor Protection

Floor thermal insulation/protection with a R value of 1.4 is required if the unit is raised 0 - 2.5" (0-64mm) (measured from the bottom of the appliance).

Thermal floor protection is not required when unit is raiser greater than 2.5" (64mm) (measured from the bottom of the appliance).

Please check to ensure that your floor protection and hearth will meet the standards for clearance to combustibles. Your hearth extension must be made from a non-combustible material. Extending 16" for US and 18" for Canada—measured from the fuel loading door.

WOOD INSERT SPECIFICATIONS

Your fireplace opening requires the following minimum sizes:
Height: 21.5" (546 mm)
Width: 25" (635 mm)
Depth: 17" (432 mm)

Two faceplates are available to seal the fireplace opening:
Standard
W 40" (1 016 mm) x H 30" (762 mm)
Oversize
W 48" (1 219 mm) x H 33" (838 mm)

Installation into a Masonry Fireplace

Regency Inserts are constructed with the highest quality materials and assembled under strict quality control procedures that insure years of trouble free and reliable performance.

It is important that you read this manual thoroughly and fully understand the safe installation and operating procedures. The more you understand the way your Regency Insert operates, the more enjoyment you will experience from knowing that your unit is operating at peak performance.

Before Installing Your Insert

1. Please read this entire manual before you install and use your new wood insert. Failure to follow instructions may result in property damage, bodily injury or even death. Install and use only in accordance with manufacturer's installation and operating instructions.

2. Check your local building codes - Building Inspection Department. You may require a permit before installing your insert. **Be aware that local codes and regulations may override some items in the manual.**

   WARNING: Careless installation is the major cause of safety hazard. Check all local building and safety codes before installation of unit.

3. Notify your home insurance company that you plan to install a fireplace insert or hearth heater.

4. Your fireplace insert is heavy and requires two or more people to move it safely. The insert can be badly damaged by mishandling.

5. If your existing fireplace damper control will become inaccessible once you have installed your Regency Insert, you should either remove or secure it in the open position.

6. Inspect your fireplace and chimney prior to installing your insert to determine that it is free from cracks, loose mortar or other signs of damage. If repairs are required, they should be completed before installing your insert. Do not remove bricks or mortar from your masonry fireplace.

7. **Do not connect the insert to a chimney system servicing another appliance or an air distribution duct.**

When referencing installation or connection to masonry fireplaces or chimneys, the masonry construction must or shall be code complying.

Chimney Specifications

Before installing, check and clean your chimney system thoroughly. If in doubt about its condition, seek professional advice. Your Regency Insert is designed for installation into a masonry fireplace that is constructed in accordance with the requirements of "The Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliance", N.F.P.A. 211, the National Building Code of Canada, or the applicable local code requirements.

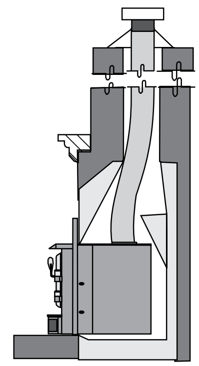
The appliance, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70, or the Canadian Electrical code, CSA C22.1.

Regency Inserts are designed to use either a 5.5" (140mm) or 6" (152mm) flue.

In Canada this fireplace insert must be installed with a continuous chimney liner of 5.5" (140 mm) or 6" (152 mm) diameter extending from the fireplace insert to the top of the chimney. The chimney liner must conform to the Class 3 requirements of CAN/ULC-S635 or CAN/ULC-S640, Standard for Lining Systems for New Masonry Chimneys.

In the U.S.A., a 5.5 inch (140 mm) or 6 inch (152 mm) diameter, stainless steel, full height chimney liner that meets type HT (2100^0 F) requirements per UL 1777 must be installed. The full liner must be attached to the insert flue collar and to the top of the existing masonry chimney.

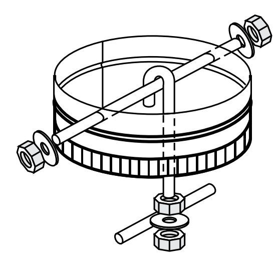
Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may cause damage. An uncontrollable burn or excessive temperature indicates excessive draft. Inadequate draft may cause back puffing 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. Ensure the heater is installed in areas that are not too close to neighbors or in valleys that would cause unhealthy air quality or nuisance conditions.



Optional Flue Connector Kit

The Straight Flue Adaptor (Part #846-504) shown here, may be used to produce a secure connection between your flue connector and the insert collar. Detailed installation instructions are included with the kit.

The following may also be purchased separately if required to complete the install:
846-506 6" Flue Adapter 30 degree
846-508 6" Flue Adapter 45 degree
948-412/P 6" Flue Offset Adapter (offsets back 4")
846-527 Flue Connector Kit



Straight adaptor shown with flue connector kit

Installation Into a Factory Built Fireplace

Regency inserts are constructed with the highest quality materials and assembled under strict quality control procedures that ensure years of trouble free and reliable performance.

It is important that you read this manual thoroughly and fully understand the installation and operating procedures. Failure to follow instructions may result in property damage, bodily injury or even death. The more you understand the way your Regency Insert operates, the more enjoyment you will experience from knowing that your unit is operating at peak performance.

Requirements for Installing Solid-fuel Inserts in Factory-built Fireplaces

1. A permit may be required for installations, final approval is contingent of the authority having local jurisdiction. Consult insurance carrier, local building, fire officials or authorities ha-ving jurisdiction about restrictions, installation inspection, and permits.
2. Inspect the existing fireplace and chimney for any damage or flaws such as burnouts, metal or refectory warping.
3. Inspection to a minimum of NFPA 211 Level II is recommended. All repairs must be made prior to installing an insert. The fireplace must be structurally sound and be able to support the weight of the solid-fuel insert.
4. The factory-built chimney must be listed per UL 127 or ULC 610-M87 for all installations. Install thermal protection as per this appliance listing requirements.
5. A full height 5.5 inch (140 mm) or 6 inch (152 mm) diameter stainless steel full height listed chimney liner must be installed meeting type HT (2100ºF) requirements per UL 1777 (USA) or ULC S635 with "0" clearance to masonry (Canada). The full liner must be attached to the insert flue collar and to the top of the existing chimney.
6. The flue liner top support attachment must not reduce the air flow for the existing air-cooled chimney system. Reinstall original factory-built chimney cap only.
7. To prevent room air passage to the chimney cavity of the fireplace, seal either the damper area around the chimney liner or the insert surround. Circulating air chamber (i.e. in a steel fireplace liner or metal hearth circulatory) may not be blocked. The air flow within and around the fireplace shall not be altered, blocked by the installation of the insert (i.e. not louvers or cooling air inlet or outlet ports may be blocked by the insert or the insert surround).
8. Means must be provided for removal of the insert to clean the chimney flue.
9. Inserts that project in front of the fireplace must be supplied with appropriate supporting means.
10. Installer must mechanically attach the supplied label to the inside of the firebox of the fireplace into which the insert is installed.

⚠ WARNING

Fire Risk.
When lining air-cooled factory-built chimneys:
- Run chimney liner approved to **UL 1777 Type HT requirements (2100ºF)**
- Reinstall original factory-built chimney cap ONLY
- DO NOT block cooling air openings in chimney
- Blocking cooling air will overheat the chimney

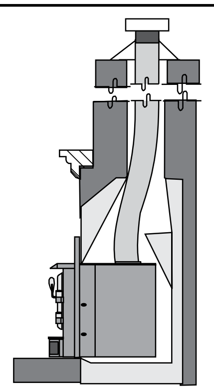
Altering the Fireplace

The following modifications of factory-built fireplaces are permissible:

The following parts may be removed:	
Damper	Smoke Shelf or Baffle
Ember Catches	Fire Grate
Viewing Screen/ Curtain	Doors

- The fireplace must be altered. Cutting any sheet metal parts of the fireplace in which the fireplace insert is to be installed is prohibited, except that the damper may be removed to accomodate a direct-connect starter pipe or chimney liner.
- External trim pieces which do not affect the operation of the fireplace may be removed providing they can be stored on or within the fireplace for reassembly if the insert is removed.
- The permanent metal warning label provided in the component pack must be attached to the back of the fireplace, with screws or nails, stating that the fireplace may have been altered to accomodate the insert, and must be returned to original condition for use as a conventional fireplace.
- If the hearth extension is lower than the fireplace opening, the portion of the insert extending onto the hearth must be supported.
- Manufacturer designed adjustable support kit can be ordered from your dealer.
- Final approval of this installation type is contingent upon the authority having jurisdiction.

WARNING: This fireplace may have been altered to accommodate an insert. It must be returned to its original condition before use as a solid fuel burning fireplace.



1. When installed in a factory built fireplace, a full stainless steel rigid or flexible flue liner is mandatory, for both safety and performance purposes. When a flue or liner is in use, the insert is able to breathe better by allowing a greater draft to be created. The greater draft can decrease problems such as, difficult start-ups, smoking out the door, and dirty glass.
2. In order to position the flue liner, the existing rain cap must be removed from your chimney system. In most cases the flue damper should also be removed to allow passage of the liner.
3. In most cases opening the existing spark screens fully should give enough room for the insert installation. If it does not, remove and store.
4. If the floor of your fireplace is below the level of the fireplace opening, adjust the insert's levelling bolts to accommodate the difference. When additional shimming is required, use non-combustible masonry or steel shims.
5. Measure approximately the alignment of the flue liner with the position of the smoke outlet hole on the insert to check for possible offset. If an offset is required, use the appropriate offset adaptor in your installation.

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 and may cause damage. An uncontrollable burn or excessive temperature indicates excessive draft. Inadequate draft may cause back puffing 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. Ensure the heater is installed in areas that are not too close to neighbors or in valleys that would cause unhealthy air quality or nuisance conditions.

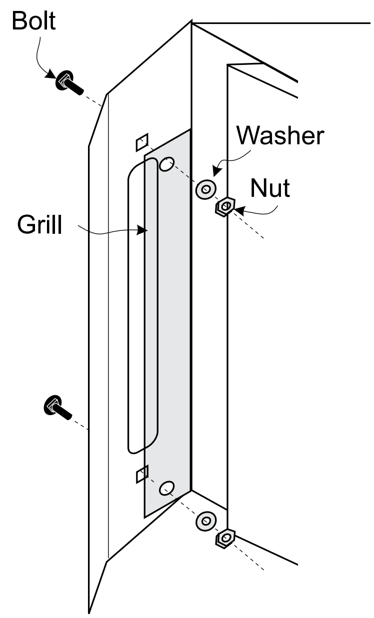
Installing Your Insert

Your insert is very heavy and will require two or three people to move it into position. The insert can be made a little lighter by removing the cast iron door by opening it and lifting it off its hinges. Be sure to protect your hearth extension with a heavy blanket or carpet scrap during the installation.

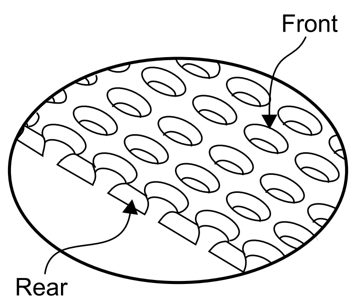
Convection Grills

The black convection grills are pre-installed on this appliance.

If the optional nickel grills are being used, remove the black grills and position the nickel grill on the inside body face side and fasten using the bolts, washers and nuts provided (2 per side) as shown in the diagrams.



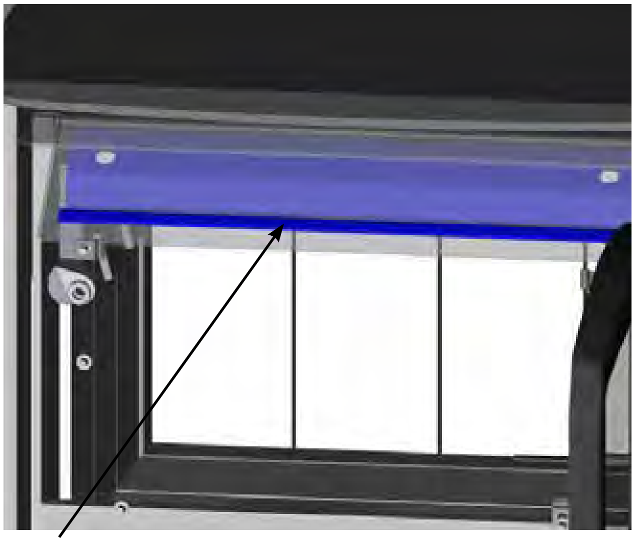
View from Rear of Insert



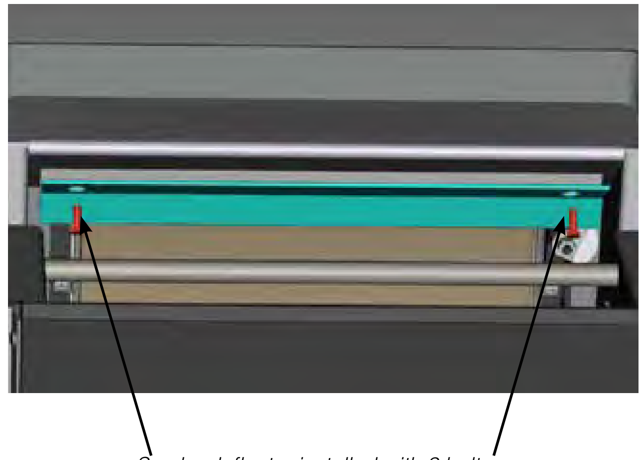
Note: The grill has a front and rear, the holes on the front side have rounded edges and the rear holes have flat edges.

Stainless Steel Smoke Deflector Installation

The stainless smoke deflector is located in the upper front area of the firebox. The deflector is held in place with 2 bolts Prior to the first fire, ensure deflector is seated properly and secured with 2 hand tightened bolts.



Smoke deflector *Smoke deflector is installed through the door opening in location shown in diagram*



Smoke deflector installed with 2 bolts.

Note: *This is a view from the back of the unit through the top.*

To replace the deflector, loosen off both bolts and slide deflector upward and out. Install new deflector and hand tighten bolts. Ensure positive location of the deflector prior to hand tightening.

WARNING: Operation of the unit with out proper installation of smoke deflector will void warranty.

Ensure deflector is seated so bolts are situated at the top of the keyhole before tightening.

Faceplate and Trim Installation

Your Faceplate kit contains:

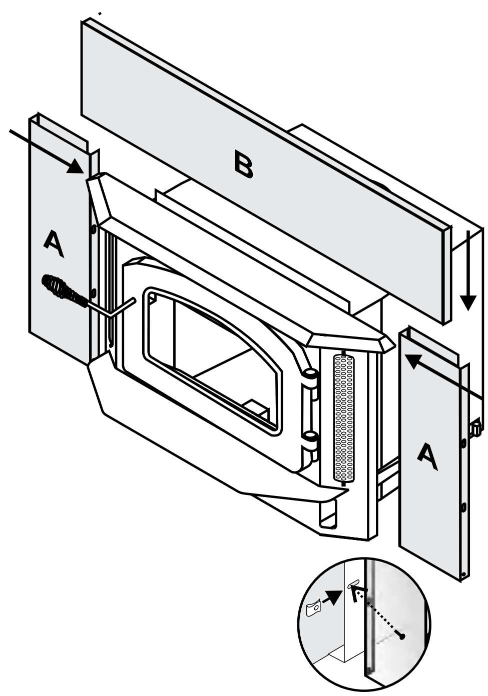
1 Set Faceplate panel (top, left & right)
1 Set Trim (top, left, right)
2 pcs. insulation
4 spring nuts
4 1" screws
8 washers
2 screws - black
2 corner trim clips

Note: The Digital Monitor Operating Door tool Bracket and tool holder are supplied with the insert.

Prior to sliding your insert into its final position and attaching the connector or liner pipe, the faceplate must be installed as follows:

1) Slide the spring nuts (supplied) over the slots in the insert's side convection panels (the spring nuts may need to be squeezed with a pair of pliers first, to help them stay in position).

2) Screw the side faceplate panels, (item A in the diagram) one to each side. See diagram 1.



3) Using the top panel (item B - see diagram 1) as a gauge, check that the side panels are within approximately 1/4" of the overall width. If the difference is greater than this, use the supplied washers to attain the required width.

4) The unit may now be slid into final position and attached to the connection system.

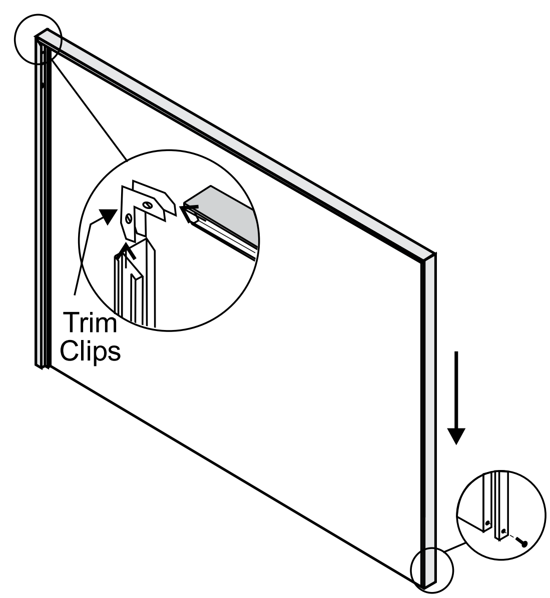
5) Once connection is made, the insulation strips should be installed between the insert faceplates and the fireplace face.

6) The faceplate top may now be installed (with insulation strip behind) by aligning its brackets with the top flange on the side shields and the angle iron bar on the insert top.

7) The faceplate trim may be installed to the edge of the faceplate at this time. To permanently mount the trim, drill two 5/32" diameter holes through the trim and side panels and screw the trim to the panels using the gold plated screws provided.

Note: It may be easier to install the insulation, faceplate top and faceplate trim with the unit pulled slightly away from the fireplace face. If this is done, be very careful not to disturb the connector when shifting the unit to its final position.

8) Now that your insert is installed, check once more that all the clearances from the unit to any combustible materials are correct as listed earlier.



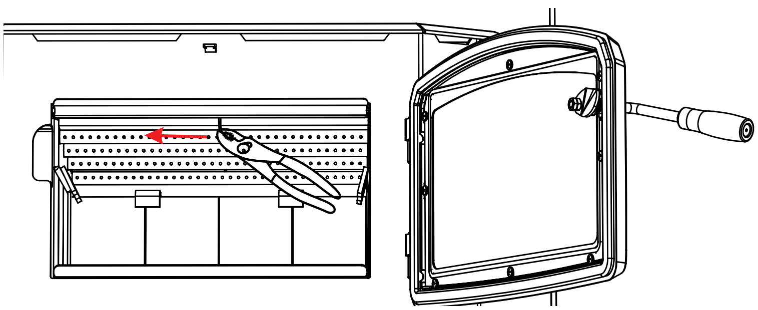
Flue Collar Removal and Installation

List of Tools required:
- Pull rod (supplied with unit)
- 1/2" socket / ratchet
- 3/8" open face wrench
- 7/16" socket / ratchet

NOTE: The removable flue collar is attached to the unit. If you need to remove the collar for ease of installation, please follow the below steps.

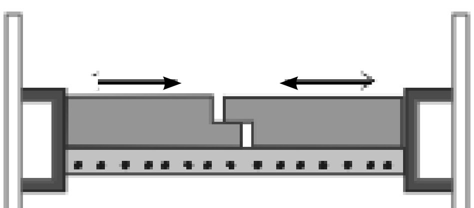
Note: unit in images may not be identical to the I2450—but they depict the process.
SAFETY NOTE: The insert is very heavy and will require two people to move it into position. The door and bricks can be removed to help. Be sure to protect your hearth extension with a heavy blanket or cardboard during the installation.

1. Allow the stove to burn out and cool down.
2. Remove stainless steel smoke deflector - See instructions in this manual.
3. Remove the front 2 secondary air tubes with pliers as shown below.



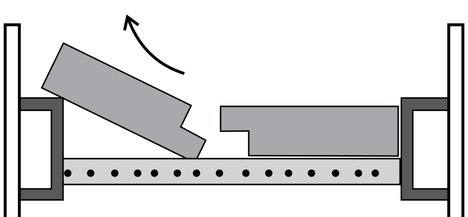
Note: F2500 shown

4. Remove baffles - push the baffles together and away from the side walls.



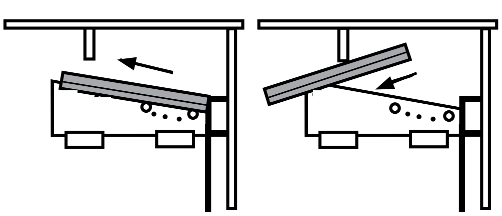
Front View

5. Lift the left baffle out from underneath the right baffle - then lift out. Remove the right baffle.



Front View

6. Manoeuver the baffle above the air tube and slide out.



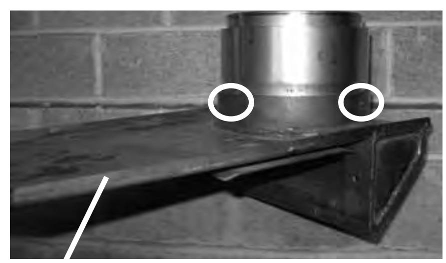
Side View

7. Take a ½" ratchet and remove the two bolts at back inside of the firebox. These bolts are used to secure the flue collar. Keep these and washers for re-install.

8. Slide collar off the unit.
9. Install flex liner into existing chimney as per liner manufacturer's specifications. See Diagram 1.

Diagram 1 *Flex Liner*

10. Secure the adaptor to the flex liner with three screws. Ensure the adapter is level and aligned correctly. See Diagram 2.



Flue Adaptor *Diagram 2*

11. Install the unit by first setting the rear of the unit into the fireplace. See Diagram 3. Ensure that the unit is centered in the existing fireplace and lined up with the flue adaptor.

Diagram 3

12. Slide the unit back until the flue adaptor is slightly engaged. At this point it is recommended to level the unit. This will keep the adaptor from binding.

13. Insert the provided pull rod through the hole in the top center of the unit. Secure the threaded end into the flue adaptor as shown in diagram 4. While sliding the unit into place pull on the rod to ensure that the flue adaptor is properly engaged. See Diagram 5. Double check the adaptor is seated properly and the pull rod in the firebox, locate the two holes lined up to the two holes on the adaptor.

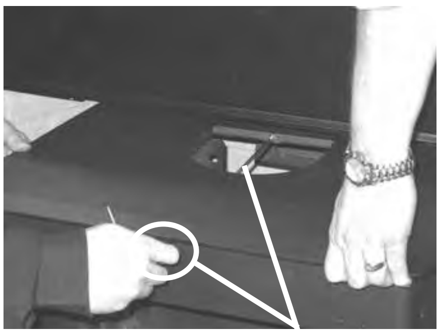


Diagram 4 *Pull Rod*

Pull Rod in place

Diagram 5

14. Use the two bolts, washers and lock washers removed in step 7 and install them, tighten down using the 1/2" socket to ensure the adapter is installed.

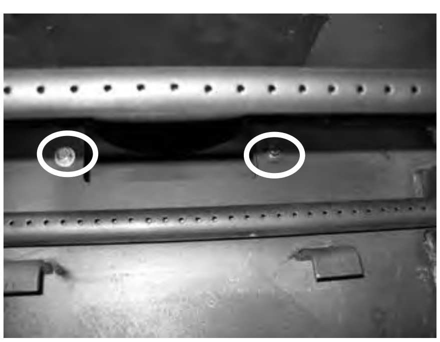


Diagram 6

15. Reverse steps 6-3 to complete the installation.

Fan Installation

Installer: Please record unit serial number here before installing blower.

Serial No.________________________________

Your fan should only be installed once the unit is in place in order to prevent any damage to the fan. To attach, follow the instructions provided with the fan.

1. Align the fan support with the offset clip on the bottom of the ashlip.

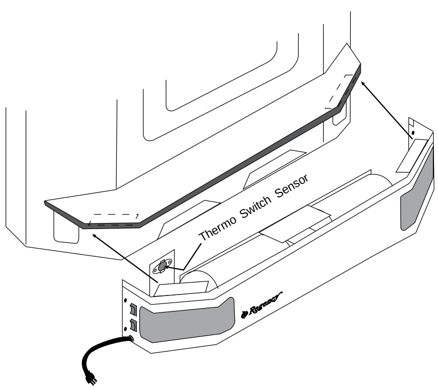
2. Slide the supports into the clips. The tension holding the clips in place may be adjusted by increasing or decreasing the offset spacing of the clips.

3. **Ensure that the power cord is not in contact with any hot stove surfaces.**

   NOTE: DO NOT ROUTE POWER CORD UNDER OR IN FRONT OF UNIT.

4. Push the Regency logo plate into the two holes in the front bottom left corner of the fan.

Do not turn fan <ON> until your insert has reached operating temperature or at least 30 minutes after starting fire.

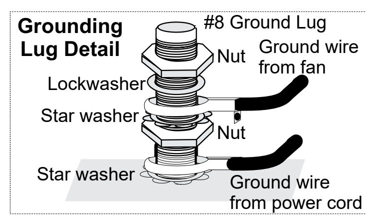


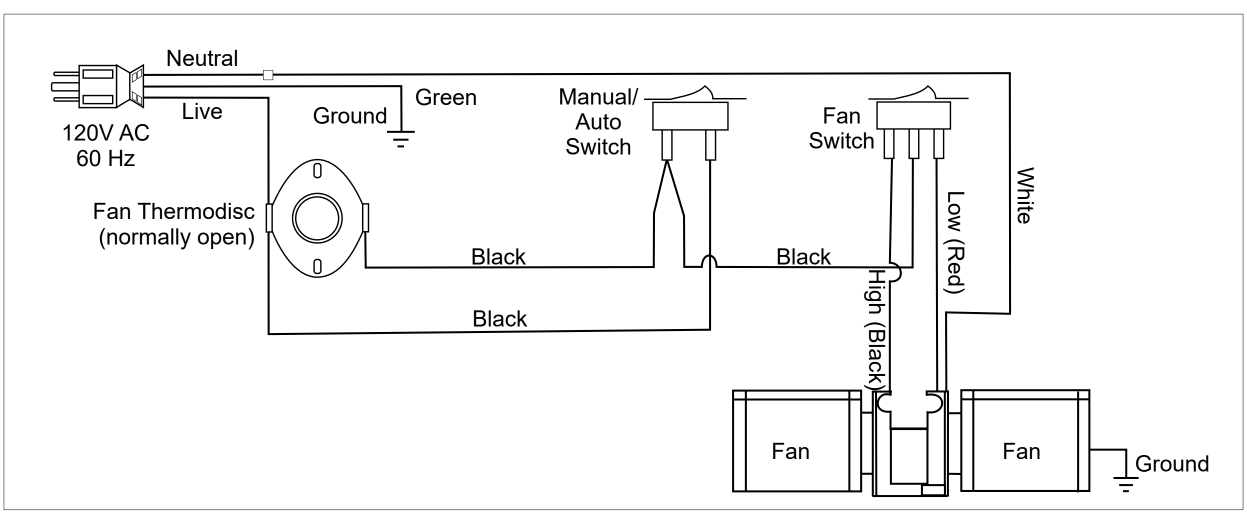
Important:

The blower to this appliance must be turned off anytime the fuel door is opened. Prior to turning the blower back on, ensure there are no embers near the blower which may have fallen onto the hearth when the fuel door was opened. Once the fuel door is closed, the blower may be turned back on.

CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

WARNING:
Electrical Grounding Instructions
This appliance is equipped with a three pronged (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from this plug.





Blower/Fan Wiring Diagram

Floor Protection

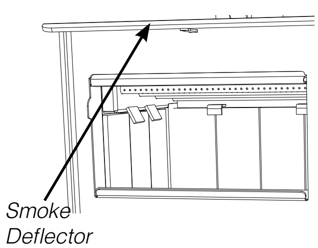
Please check to ensure that your floor protection and hearth will meet the standards for clearance to combustibles. Your hearth extension must be made from a non-combustible material.

Flue Baffle & Secondary Air Tube Installation

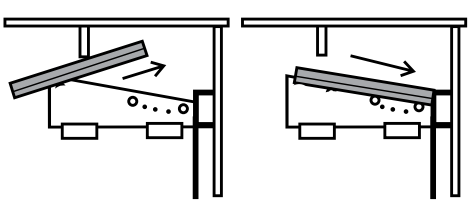
The flue baffle system located in the upper area of the firebox is removable to make cleaning your chimney system easier. The baffles must be installed prior to your first fire. **Smoke spillage and draft problems may occur if the baffles are improperly positioned.** Check the position of the baffles on a regular basis as they can be dislodged if too much fuel is forced into the firebox.

The unit arrives with the 2 baffles and 2 air tubes on the floor of the firebox.

1. Open the door and remove stainless steel smoke deflector - See smoke deflector instructions in this manual.

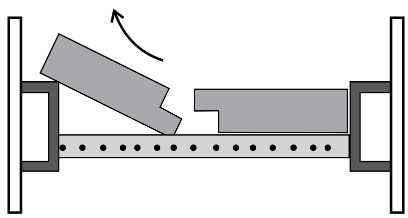


2. Slide the left baffle over the 2 remaining air tubes from the front and then push it to the back.



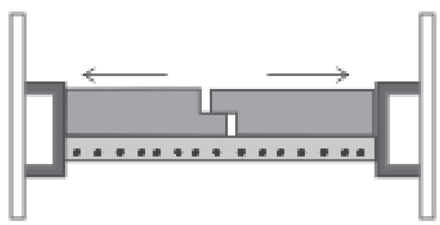
Side View

3. Tilt the left baffle up on top of the side channel and it will leave enough room to position the right baffle in the same manner as Step 1) above. Then reposition the left baffle flat on the air tubes.



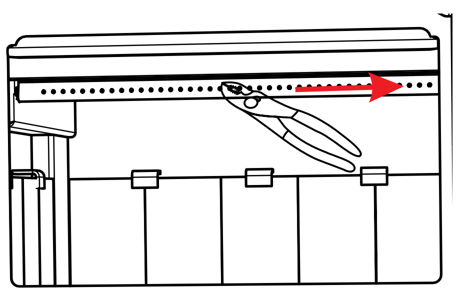
Front View

Important: Push both baffles so they are tight against the side walls.



Front View

4 . Install the 2 front secondary air tubes with pliers and hammer to lock them into place, as shown below.

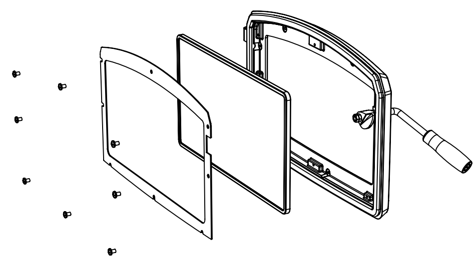


5. Reverse Step 1.

Glass Replacement

Your Regency stove is supplied with 5 mm Neoceram ceramic glass that will withstand the highest heat that your unit will produce. In the event that you break your glass by impact, purchase your replacement from an authorized Regency dealer only.

Remove the door from the stove and remove the screws securing the glass retainer. Position the glass in the door, make sure that the glass gasketing will properly seal your unit, and replace the retainer, it should rest on the gasket not the glass. Tighten securely, but do not wrench down on the glass as this may cause the glass to break.



Shown with Classic Door

Wood Door & Handle Assembly

1. In preparation of installing the door handle, the nuts, cam, washers and spacer must be removed as shown in Diagram 1.

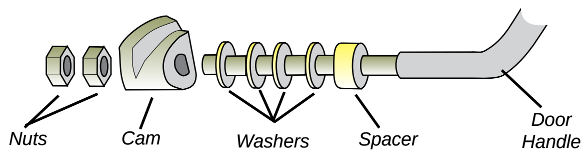


Diagram 1

LATCH ADJUSTMENT

The door latch may require adjustment as the door gasket material compresses over time. Removal of 1 or 2 washers will allow the latch to move closer to the door frame, causing a tighter seal. (Refer to Diagram 1)

2. Place the door onto the hinges and then place the door handle through the opening on the door, as shown in Diagram 2.

   Re-assemble and secure the door handle components in reverse order as removed in step 1, refer to Diagram 1.
3. Put the hinge cover caps on top of hinges to complete the door installation.

Note: The bottom of the door may scrape the ashlip. In this case place the spacers provided on the door hinges of the unit before placing the door.

4. Close door and ensure there is a tight seal. If door is too tight, a washer can be added. If the door is not creating a tight seal, a washer can be removed. Recheck door to ensure there is still a tight seal. Repeat steps if door seal is still not tight until a tight seal has been achieved. The handle should be approximately in the 8 o'clock position when door is fully closed.(Diagram 3)

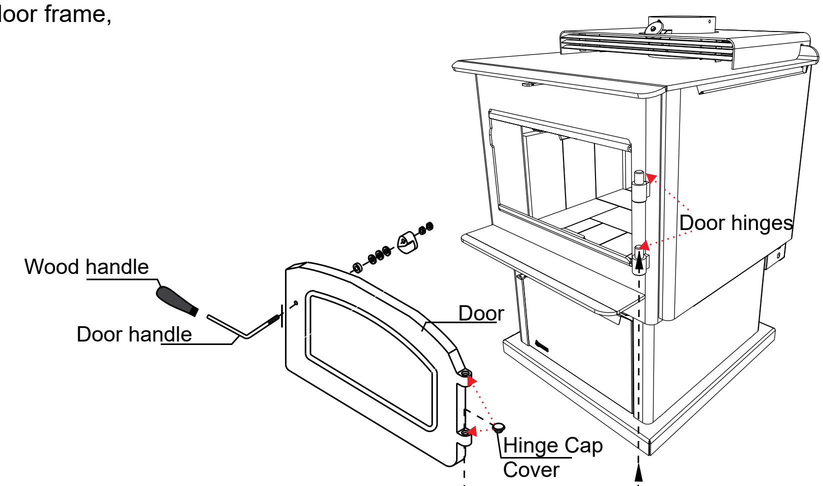


Diagram 2

Note: Freestanding stove shown. Door assembly instructions are no different for the insert models.

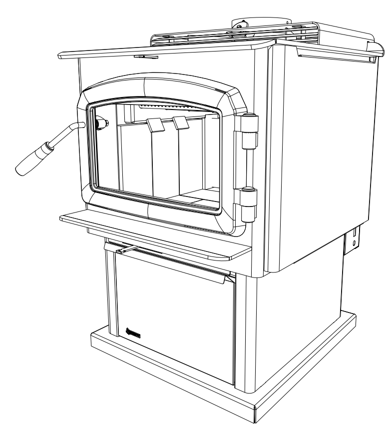
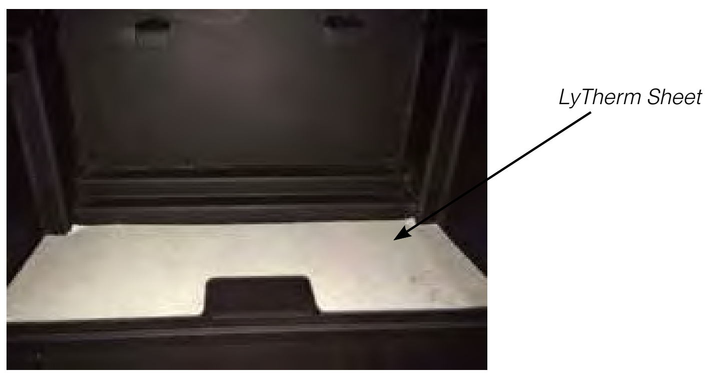


Diagram 3

Brick Installation

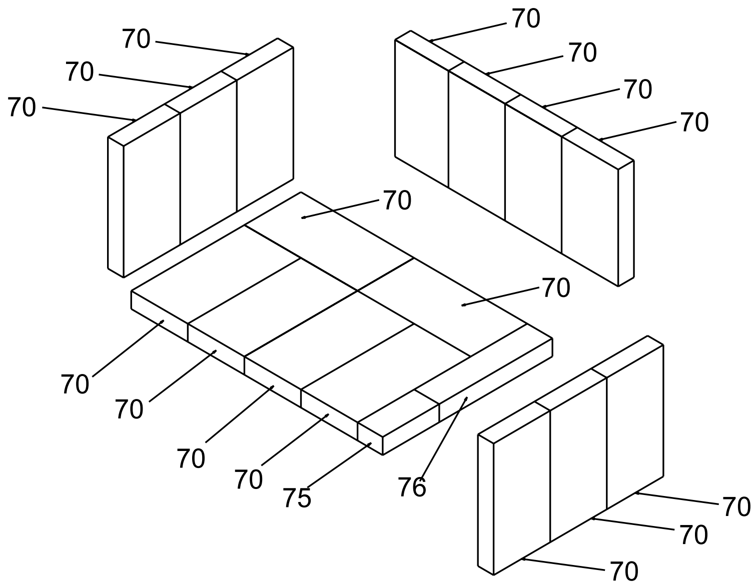
Firebrick is included to extend the life of your stove and radiate heat more evenly. Check to see that all firebricks are in their correct positions and have not become misaligned during shipping. Install all firebricks (if bricks were removed at install) per the diagram below and place in their correct positions.
Do not use a grate.



Order of firebrick install:

a) Rear Firebrick
b) Firebox Floor - install brick over LyTherm Sheet
c) Right and Left Side Firebricks

	180-960	Firebrick - Complete Set
70)	902-111	Brick Regular Full Size: 1-1/4" x 4-1/2" x 9"
75)	*	Brick Partial: 1-1/4 x 4-1/2" x 2"
76)	*	Brick Partial: 1-1/4" x 2" x 9"



Seasoned Wood

Whether you burn wood in a fireplace, stove or insert, good quality firewood is the key to convenience, efficiency and safety. Wet wood and pieces that are not the right size and shape for your wood burner can be frustrating, burn inefficiently and deposit creosote that can fuel a dangerous chimney fire. Good planning, seasoning and storage of the firewood supply are essential to successful wood burning.

- Stack the wood in separate rows in an open location where the summer sun can warm it and breezes can carry away the moisture. Do not stack unseasoned wood tightly in an unvented storage area.
- Do not allow firewood to lie on the ground for more than a couple of days before stacking. Mould and rot can set in quickly.
- Stack the wood up off the ground on poles, lumber rails or pallets.
- The top of the pile can be covered to keep off rain, but do not cover the sides.

Softer woods like pine, spruce and poplar/aspen that is cut, split and stacked properly in the early spring maybe be ready for burning in the fall. Extremely hard woods like oak and maple, and large pieces of firewood, may take a minimum of a full year to dry enough. Drying may also take longer in damp climates

There are a few ways to tell if wood is dry enough to burn efficiently. Use as many indicators as possible to judge the dryness of the firewood your are considering. Here are ways to judge firewood moisture.

- Using a moisture meter, select the species of fuel and then penetrate the pins into a split piece. Ideal moisture and seasoned firewood should be less than 20% moisture content.
- Checks or cracks in the end grain can be an indication of dryness, but may not be a reliable indicator. Some wet wood has checks and some dry wood has no checks.
- The wood tends to darken from white or cream colour to grey or yellow as it dries.
- Two dry pieces banged together sound hollow; wet pieces sound solid and dull.
- Dry wood weighs much less than wet wood.
- Split a piece of wood. If the exposed surface feels damp, the wood is too wet to burn.

Operating Instructions

With your unit now correctly installed and safety inspected by your local authority, you are now ready to start a fire. Before establishing your first fire, it is important that you fully understand the operation of your draft control.

WARNING
Fireplace Stoves equipped with doors should be operated only with doors fully closed. If doors are left partly open, gas and flame may be drawn out of the fireplace stove opening, creating risks from both fire and smoke.

Draft Control

Both the primary and air wash drafts are controlled by the control slide located on the front left side of the unit. To increase your draft - slide to the left to open, and to decrease - slide to the right to close. The I2450 unit has a secondary draft system that continually allows combustion air to the induction ports at the top of the firebox.

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 and may damage the unit. Inadequate draft may cause back puffing into the room and plugging of the chimney.

Outward - Open **Inward - Closed**

Side Draft Control

Left - Open **Right - Closed**

WARNING: To build a fire in ignorance or to disregard the information contained in this section can cause serious permanent damage to the unit and void your warranty!

First Fire

When your installation is completed and inspected you are ready for your first fire.

THIS UNIT IS DESIGNED TO BURN SEASONED CORDWOOD ONLY. COAL, BRIQUETTES AND ALL OTHERS LISTED ON PAGE 2 ARE NOT APPROVED. SEASONED CORDWOOD SHOULD BE LESS THAN 20% MOISTURE CONTENT.

START UP AND OPERATING PROCEDURES:

1. For the first few days, the stove will give off an odour from the paint. This is to be expected as the high temperature paint becomes seasoned. Windows and/or doors should be left open to provide adequate ventilation while this temporary condition exists. Burning the stove at a very high temperature the first few times may damage the paint. Burn fires at a moderate level the first few days.
2. Do not place anything on the stove top during the curing process. This may result in damage to your paint finish.
3. During the first few days it may be more difficult to start the fire. As you dry out your firebrick and your masonry flue, your draft will increase.
4. Open the air control to fully open position (all the way to the left) and open the front fuel door. Load firebox with 1.7lb of kindling and crumpled paper and light crumpled paper to establish fire. DO NOT USE A GRATE TO ELEVATE THE FIRE.
   CAUTION: Never leave unit unattended if door is left open. This procedure is for fire start-up only, as unit may overheat if door is left open for too long.
5. Keep the door partially open for approximately 3 minutes and then close door.
   WARNING: Never build a roaring fire in a cold wood insert. Always warm your wood insert up slowly!
6. Once most of the kindling has burned down, add more kindling and a few bigger pieces of startup wood split approximately 2 inches thick. Keep the door open until flames are reestablished.
7. When a good fire is established, add 8-10 more pieces of startup wood and close the door right away.
8. Once a nice coal bed is established and there are still good sized flames, the main larger logs can be loaded into the firebox. Rake the coals to create a uniform charcoal bed. Load 5 pieces of 17" long cord wood front to back, North/South orientation.
9. Once strong flames are established close the door.
10. After 20 minutes the fan can be set on high setting.
11. After 30 minutes the damper can be adjusted to low or medium setting and the fan switched to the low setting.
12. For those units installed at higher elevations or into sub-standard masonry fireplaces, drafting problems may occur. Consult an experienced dealer or mason on methods of increasing your draft.
13. Some cracking and popping noises may be experienced during the heating up process. These noises will be minimal when your unit reaches temperature.
14. Before opening your door to reload, open the air control fully for approximately 10 to 15 seconds until the fire has been re-established. This will minimize any smoking (spilling) back into the room. After loading wood and front door closed, close the air control to your desired setting only once the fire has been reestablished.
15. All fuel burning appliances consume oxygen during operation. It is important that you supply a source of fresh air to your unit while burning. A slightly opened window is sufficient for the purpose. If you also have a fireplace in your home, a downdraft may be created by your Regency Stove causing a draft down your chimney. If this occurs, slightly open a window near your unit.

WARNING: If the body of your unit, or any part of the chimney connector starts to glow, you are over firing. Stop loading fuel immediately and close the draft control until the glow has completely subsided.

16. If you have been burning your stove on a low draft, use caution when opening the door. After opening the damper, open the door a crack, and allow the fire to adjust before fully opening the door.
17. The controls of your unit or the air supply passages should not be altered to increase firing for any reason.
18. If you burn the unit too slowly or at too low a setting your unit will not be operating as efficiently as it can. An easy rule of thumb says that if your glass is clean, then your flue is clean and your exhaust is clean. Burn the stove hot enough to keep your glass clean, you won't need to clean your flue as often.

How to Light & Maintain a Wood Stove Fire

Fan Operation

Automatic
To operate the fan - turn on the rheostat.

This will allow the fan to turn on as the stove has come up to operating temperature. It will also shut the fan system off after the fire has gone out and the unit cooled to below a useful heat output range.

Operate the fan in the low speed position when burning in the LOW-MED LOW heat output ranges and operate in the high setting for MED-HIGH to HIGH heat outputs.

Route power cord to either left or right behind unit.

Ash Disposal

During constant use, ashes should be removed every few days.

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 cinders have thoroughly cooled.

Safety Precautions

1. Do not allow ashes to build up to the loading doors! Only remove ashes when the fire has died down. Even then, expect to find a few hot embers.

2. Please take care to prevent the build-up of ash around the start-up air housing located inside the stove box, under the loading door lip.

Safety Guidelines and Warnings

CAUTION: Do not use chemicals AS fluids to start fire.

1. **CAUTION:** Never use gasoline, gasoline type lantern fuels, kerosene, charcoal lighter fuel, or similar liquids to start or 'freshen up' a fire in your heater. Keep all such liquids well away from the heater while it is in use.

2. Keep the door closed during operation and maintain all seals in good condition.

3. Do not burn any quantities of paper, garbage, and never burn flammable fluids such as gasoline, naptha or engine oil in your stove.

4. If you have smoke detectors, prevent smoke spillage as this may set off a false alarm.

5. Do not overfire heater. If the chimney connector, flue baffle or the stove top begin to glow, you are over firing. Stop adding fuel and close the draft control. Over firing can cause extensive damage to your stove including warping and premature steel corrosion. Over firing will void your warranty.

6. Do not permit creosote or soot build-up in the chimney system. Check and clean chimney at regular intervals. Failure to do so can result in a serious chimney fire.

7. Your Regency stove can be very hot. You may be seriously burned if you touch the stove while it is operating, keep children, clothing and furniture away. Warn children of the burn hazard.

8. The stove consumes air while operating, provide adequate ventilation with an air duct or open a window while the stove is in use.

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

10. Do not use grates or andirons or other methods for supporting fuel. Burn directly on the bricks.

11. Open the draft control fully for 10 to 15 seconds prior to slowly opening the door when refuelling the fire.

12. Do not connect your unit to any air distribution duct.

13. This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods.

14. In the event of component failure, replace parts with only Regency listed parts.

15. Warning: do not abuse glass door such as striking or slamming shut.

16. Do not store any fuel closer than 2 feet from your unit. Do not place wood, paper, furniture, drapes or other combustibles near the appliance.

17. **CAUTION**: Do not operate with broken glazing.

CAUTION: HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS.

Maintenance

It is very important to carefully maintain your fireplace stove, including burning seasoned wood and maintaining a clean stove and chimney system. Have the chimney cleaned before the burning season and as necessary during the season, as creosote deposits may build up rapidly. Moving parts of your stove require no lubrication.

Creosote

When wood is burned slowly, it produces tar and other organic vapours combine with moisture to form creosote. The creosote vapours condense in the relatively cool chimney flue of a slow burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote can result in an extremely hot fire.

The chimney connector and chimney should be inspected at least once every two months during the heating season to determine if creosote build up has occurred. If creosote has accumulated it should be removed to reduce the risk of chimney fire.

CAUTION: Things to remember in case of a chimney fire:

1. Close all draft and damper controls.

2. CALL THE FIRE DEPARTMENT.

Ways to Prevent and Keep Unit Free of Creosote

1. Burn stove with the draft control wide open for about 10-15 minutes every morning during burning season.
2. Burn stove with draft control wide open for about 10 - 15 minutes every time you apply fresh wood. This allows the wood to achieve the charcoal stage faster and burns up any unburned gas vapours which might otherwise be deposited within the system.
3. **Only burn seasoned wood!** Avoid burning kiln dried, wet or green wood. Seasoned wood has been dried at least one year.
4. A small hot fire is preferable to a large smouldering one that can deposit creosote within the system.
5. The chimney and chimney connector should be inspected at least once every two months during the heating season to determine is a creosote buildup has occurred.
6. **Have chimney system and unit cleaned by competent chimney sweeps twice a year during the first year of use and at least once a year thereafter or when a significant layer of creosote has accumulated (3 mm/1/8" or more) it should be removed to reduce the risk of a chimney fire.**

Door Gasket

If the door gasket requires replacement, use a 7/8" gasket rope (Part #846-570). A proper high temperature gasket adhesive is required. See your Regency Dealer.
The door catch may require adjustment as the door gasket compresses after a few fires. The door latch compression may require adjustment to renew seal. Removal of a shim, (see section in this manual), will allow the latch to be moved closer to the door frame, causing a tighter seal.

Glass Maintenance

Your Regency stove is supplied with 5mm Neoceram ceramic glass (Part #846-308) that will withstand the highest heat that your unit will produce. In the event that you break your glass by impact, purchase your replacement from an authorized Regency dealer only, and follow our step-by-step instructions for replacement (refer to Glass Replacement section).

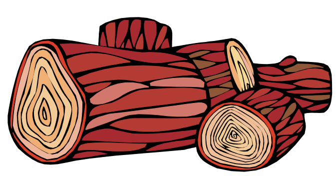
Allow the stove to cool down before cleaning the glass. Cleaning the glass will prevent build up of carbon and allow full view of the fire.

WARNING: Do not clean the glass when it is hot.

WARNING: Do not use abrasive cleaners, a damp cloth and glass cleaner is effective.

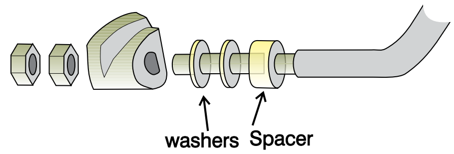
Wood Storage

Store wood under cover, such as in a shed, or covered with a tarp, plastic, tar paper, sheets of scrap plywood, etc., as uncovered wood can absorb water from rain or snow, delaying the seasoning process.



Latch Adjustment

The door latch may require adjustment as the door gasket material compresses after a few fires. Removal of the spacer washer, shown in the diagram below, will allow the latch to be moved closer to the door frame, causing a tighter seal. Remove and replace the nuts, washer and spacer as shown.



Removing Wooden Handle

1. To remove the wooden door handle from unit, firstly locate 7/64” Allen key hole at the bottom of wooden handle.

2. Unscrew 7/64” Allen Key screw counterclockwise. Once the screw is completely loose, remove and drop the handle down off the door handle shaft and replace with new handle.

DO NOT BURN:

- Treated wood
- Coal
- Garbage
- Cardboard
- Solvents
- Colored Paper
- Trash
- Salt drift wood
- Cut lumber, plywood, mill ends.

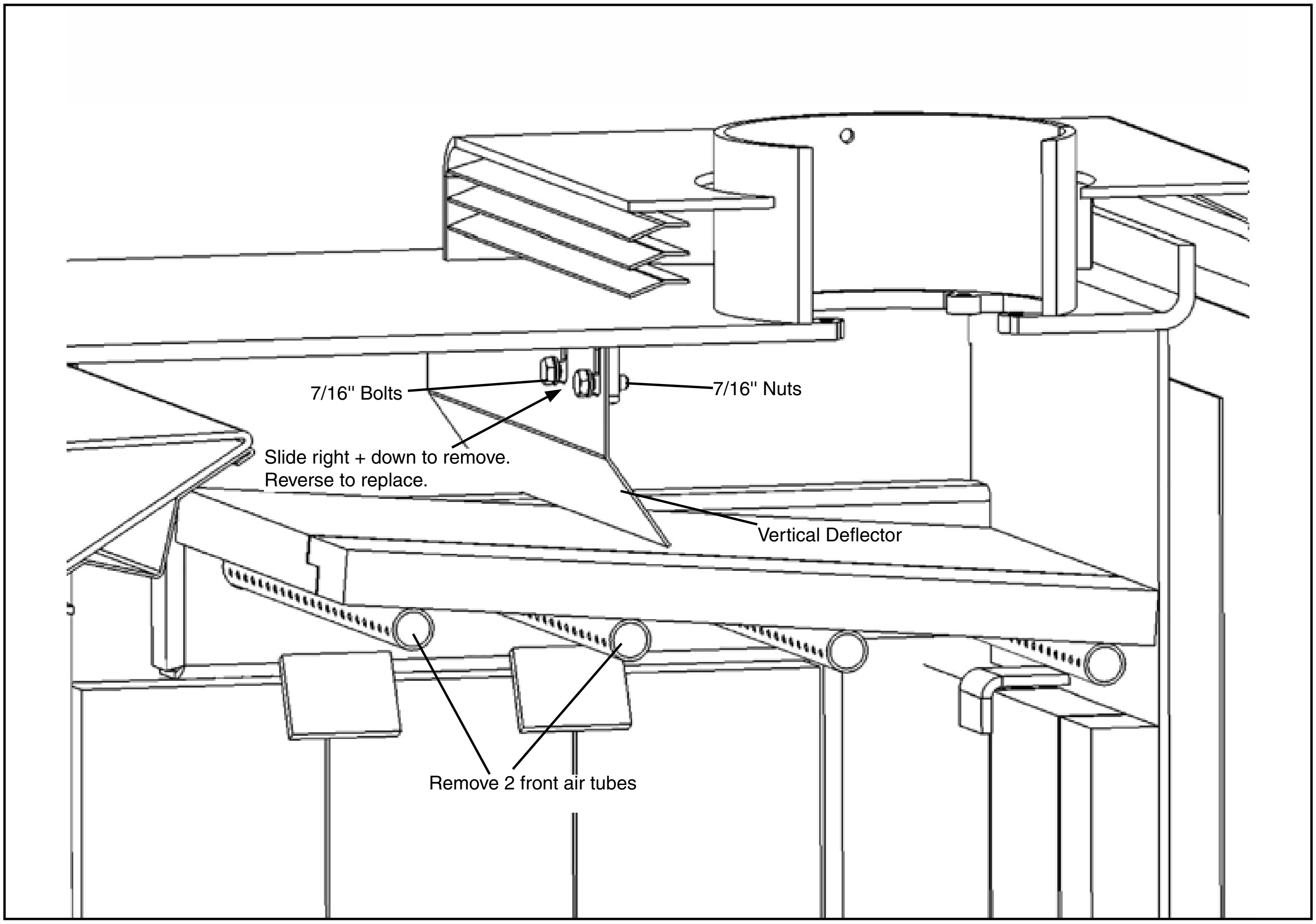
Burning treated wood, garbage, solvents, colored paper or trash may result in release of toxic fumes. Burning coal, cardboard, or loose paper can produce soot, or large flakes of char or fly ash, causing smoke spillage into the room.

CAUTION: DO NOT BURN GARBAGE OR FLAMMABLE LIQUIDS SUCH AS GASOLINE, NAPTHA OR ENGINE OIL. SOME FUELS COULD GENERATE CARBON MONOXIDE AND ARE VERY DANGEROUS.

CAUTION: DO NOT CONNECT TO, OR USE IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCT WORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATION.

Cleaning & Maintaining Your Wood Stove

Vertical Stainless Deflector Replacement



1. Remove 2 front secondary air tubes / vermiculite baffles as per page 15.
2. Loosen the two 7/16'' bolts + nuts to remove / replace vertical deflector.
3. Repeat steps to install new vertical deflector.

NOTE: ENSURE THAT VERTICAL DEFLECTOR IS PUSHED UP AS FAR AS POSSIBLE. TIGHT TO TOP OF FIREBOX.

Note that the unit is not exactly as shown.

Annual Maintenance	
Completely clean out entire unit	Annually
Inspect air tube and bricks	Replace any damaged parts.
Adjust door catch assembly	If unable to obtain a tight seal on the door - replace door gasket seal. Readjust door catch after new gasket installed.
Inspect condition and seal of: Glass Gasket Door Gasket	Perform paper test - replace gasket if required
Paper Test	Test the seal on the loading door with a paper bill. Place a paper bill in the gasket area of the door on a cold stove. Close the door. Try to remove the paper by pulling. The paper should not pull out easily, if it does, try adjusting the door latch, if that doesn't solve the problem replace the door gasket.
Check and lubricate door hinge + latch	Use only high temperature anti seize lube. (ie. never seize)
Check glass for cracks	Replace if required.
Clean blower motor	Disconnect power supply. Remove and clean blower. ***DO NOT LUBRICATE***
Inspect and clean chimney	Annual professional chimney cleaning recommended.

NOTE:

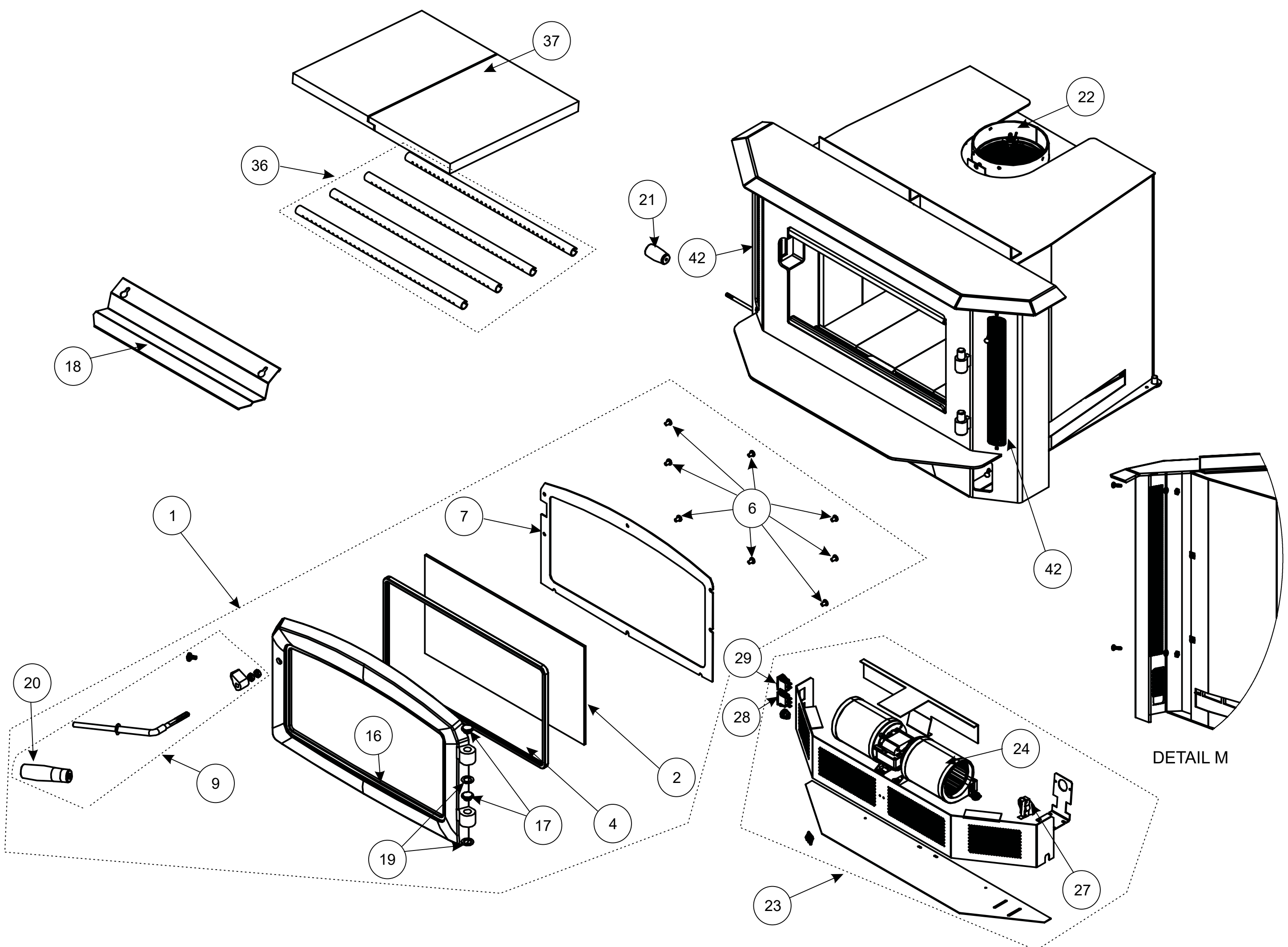
Chimney Cleaning

When cleaning the chimney system the air tubes, baffles should be removed for ease of cleaning. See manual for details on removal. We highly recommend that the chimney cleaning be done by a professional as they will have the necessary tools such as a proper sized brush and special vacuum cleaner designed to deal with fine particles.

Main Assembly & Options - I2450M

	Part #	Description
1)	850-251	Door Assy - Large Black
	850-253	Door Assy - Large Nickel Accent
2)	846-308	Glass - Replacement
4)	936-241	7/8" Adhesive Tape Gasket
6)	904-115*	Screw 1/4-20 x 3/8"
7)	181-034F	Glass Retainer - Large
9)	021-973	Door Handle Assembly
16)	846-570	Door Gasket Kit
17)	948-079BN	Hinge Caps - Nickel (each)
17)	846-918	Hinge Caps Black Oxide (Set of 2)
18)	021-018	Smoke Detector
19)	650-084	Door Spacer
20)	948-146	Wood Handle
21)	181-039	Draft Control Handle
22)	181-632/P	Flue Adaptor
23)	142-917	Fan Assembly
24)	910-157/P	Fan Motor 120 Volts
*	910-678	Power Cord 120 Volts
27)	910-142	Fan Thermodisc
28)	910-140	Fan Speed Hi / OFF / Low Switch (3-way)
29)	910-138	Auto / Manual On / OFF Switch
30)	*	Grommet Strain Relief
36)	033-953	Air Tube 3/4" (Qty:4) (each)
37)	020-957	Baffle (2/set)
42)	163-931	Convection Grill - Nickel (Opt)
	163-930	Convection Grill - Blk
43)	*	Hex Nut 10-24 Zinc Coated
44)	*	Washer #10 Flat
45)	*	Bolt, 10-24 x 3/4" Blk Carriage
N/S	181-085/P	Vertical Stainless Deflector
N/S	021-022	Firebox Floor Gasket
	948-223	Regency Logo - Nickel
	920-082	Manual

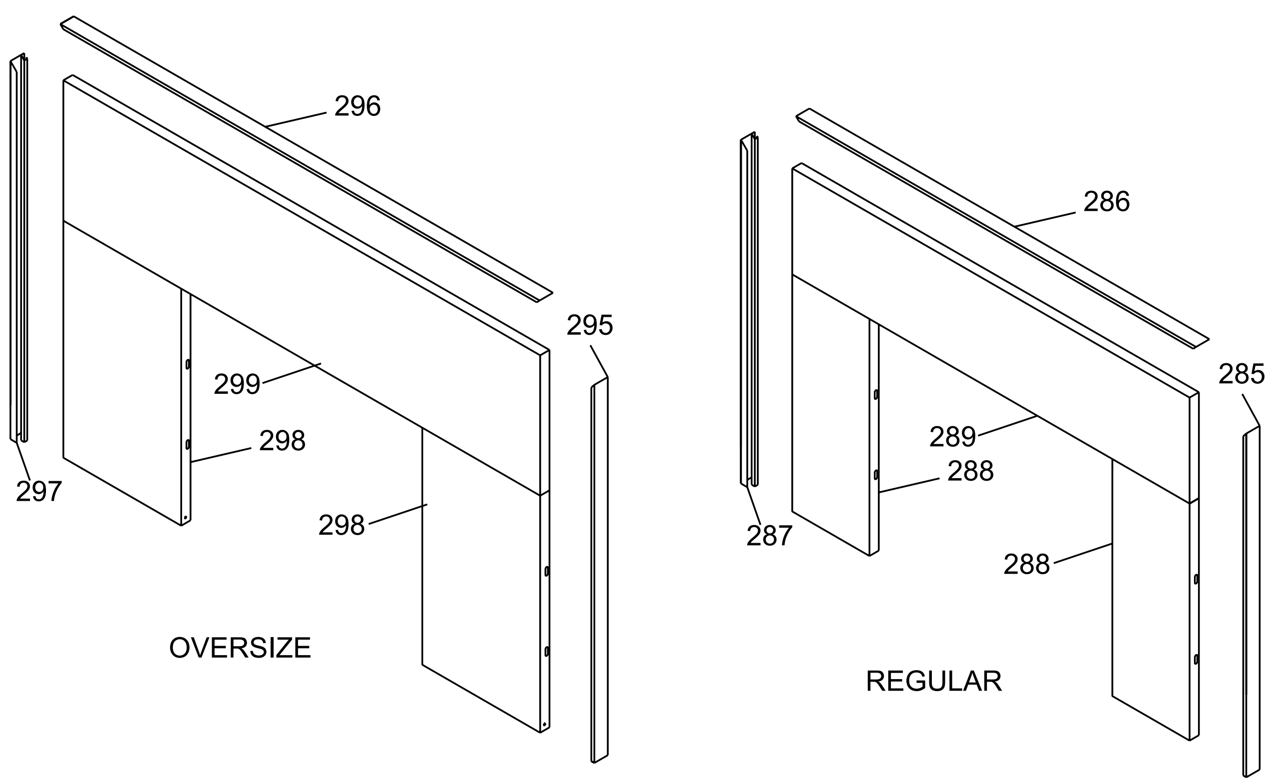
*Not available as a replacement part.



Faceplates - I2450M

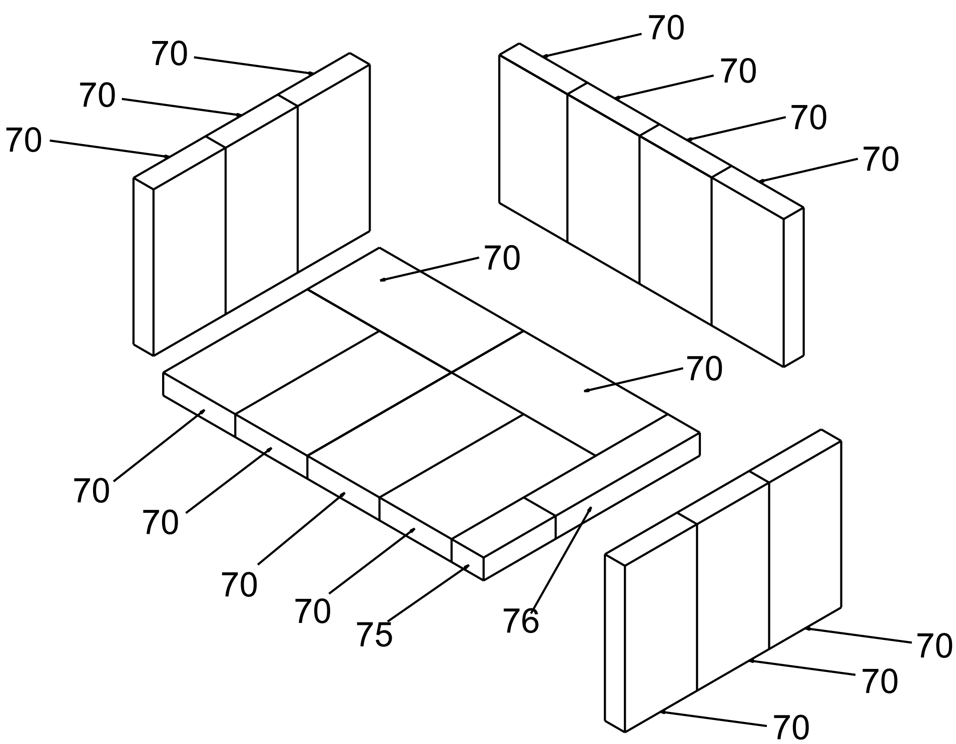
Part #	Description
140-911	Faceplate & Trim Set - Regular
180-570	Black Trim Regular (set of 3)
285) *	Trim Right Regular
286) *	Trim Top Regular
287) *	Trim Left Regular
288) *	Faceplate Side Regular
289) *	Faceplate Top Regular
140-913	Faceplate & Trim Set - Oversize
180-572	Black Trim Oversize (set of 3)
295) *	Trim Right Oversize
296) *	Trim Top Oversize
297) *	Trim Left Oversize
298) *	Faceplate Side Oversize
299) *	Faceplate Top Oversize

*Not available as a replacement part.



Brick Panels - I2450M

	Part #	Description
	180-960	Firebrick - Complete Set
70)	902-111	Brick Regular Full Size: 1-1/4" x 4-1/2" x 9"
75)	*	Brick Partial: 1-1/4 x 4-1/2" x 2"
76)	*	Brick Partial: 1-1/4" x 2" x 9"



Limited Lifetime Warranty

FPI Fireplace Products International Ltd. (for Canadian customers) and Fireplace Products U.S., Inc. (for U.S. customers) (collectively referred to herein as "FPI") extends this Limited Lifetime Warranty to the original purchaser of this appliance provided the product remains in the original place of installation. The items covered by this limited warranty and the period of such coverage is set forth in the table below.

Some conditions apply (see below).

The policy is not transferable, amendable, or negotiable under any circumstances.

Wood Products	Component Coverage					Labor Coverage
Components Covered	Limited Lifetime	5 years	2 years	1 year	Warranty	(Years)
Welded Firebox Steel	✓					5
All Stainless Steel Components, Smoke Deflectors, Heat Shields etc.	✓					3
Air Tubes	✓					3
Airmate	✓					3
Door handle and latch assembly, all hardware	✓					3
Glass Thermal Breakage Only	✓					3
Steel Faceplates, Accessory Housings	✓					3
All Plating	✓					3
Ash Drawer, Heatshields, Pedestal	✓					
All Baffles, Steel, Ceramic, Vermiculite C-Baffles	✓					
All castings, firebox, surrounds, doors, panels etc.		✓				3
All Electrical, Blower, wiring, switches etc.			✓			2
Glass - Crazing				✓		1
Catalyst Combustor					*10 Years Prorated	
Venting/Chimney				✓		1
Screens				✓		1

*See specific warranty details in regards to the catalyst combustor in unit manual.

Conditions:

Warranty protects against defect in manufacture or FPI factory assembled components only, unless herein specified otherwise.

Any part(s) found to be defective during the warranty period as outlined above will be repaired or replaced at FPI's option through an accredited distributor, dealer or pre-approved and assigned agent provided that the defective part is returned to the distributor, dealer or agent for inspection if requested by FPI. Alternatively, FPI may at its own discretion fully discharge all of its obligations under the warranty by refunding the verified purchase price of the product to the original purchaser. The purchase price must be confirmed by the original Bill of Sale.

The authorized selling dealer, or an alternative authorized FPI dealer if pre-approved by FPI, is responsible for all in-field diagnosis and service work related to all warranty claims. FPI is not responsible for results or costs of workmanship of unauthorized FPI dealers or agents in the negligence of their service work.
At all times FPI reserves the right to inspect reported complaints on location in the field claimed to be defective prior to processing or authorizing of any claim. Failure to allow this upon request will void the warranty.

All warranty claims must be submitted by the dealer servicing the claim, including a copy of the Bill of Sale (proof of purchase by you). All claims must be complete and provide full details as requested by FPI to receive consideration for evaluation. Incomplete claims may be rejected.

Replacement units are limited to one per warranty term. Airtube and baffle replacements are limited to one replacement per term.

Unit must be installed according to all manufacturers' instructions as per the manual.

All Local and National required codes must be met.

The installer is responsible to ensure the unit is operating as designed at the time of installation.

The original purchaser is responsible for annual maintenance of the unit, as outlined in the owner's manual. As outlined below, the warranty may be voided due to problems caused by lack of maintenance.

Repair/replacement parts purchased by the consumer from FPI after the original coverage has expired on the unit will carry a 90 day warranty, valid with a receipt only. Any item shown to be defective will be repaired or replaced at our discretion. No labor coverage is included with these parts.

Exclusions:
This Limited Lifetime Warranty does not extend to rust or corrosion of any kind due to: a lack of maintenance or improper venting, lack of combustion air provision, or exposure to corrosive chemicals (i.e. chlorine, salt, air, etc.).

This Limited Lifetime Warranty also does not extend to: paint, firebricks (rear, sides, or bottom), door gasketing, glass gasketing (or any other additional factory fitted gasketing), vermiculite floor bricks, andiron assemblies, and flue damper rods.

Malfunction, damage or performance based issues as a result of environmental conditions, location, chemical damages, downdrafts, installation error, installation by an unqualified installer, incorrect chimney components (including but not limited to cap size or type), operator error, abuse, misuse, use of improper fuels (such as unseasoned cordwood, mill-ends, construction lumber or debris, off-cuts, treated or painted lumber, metal or foil, plastics, garbage, solvents, cardboard, coal or coal products, oil based products, waxed cartons, compressed pre-manufactured logs, kiln dried wood), lack of regular maintenance and upkeep, acts of God, weather related problems from hurricanes, tornados, earthquakes, floods, lightning strikes/bolts or acts of terrorism or war, which result in malfunction of the appliance are not covered under the terms of this Limited Lifetime Warranty.

FPI has no obligation to enhance or modify any unit once manufactured (i.e. as products evolve, field modifications or upgrades will not be performed on existing appliances).

This warranty does not cover dealer travel costs for diagnostic or service work. All labor rates paid to authorized dealers are subsidized, pre-determined rates. Dealers may charge homeowner for travel and additional time beyond their subsidy.

Any unit showing signs of neglect or misuse will not be covered under the terms of this warranty policy and may void this warranty. This includes units with rusted or corroded fireboxes which have not been reported as rusted or corroded within three (3) months of installation/purchase.

Units which show evidence of being operated while damaged, or with problems known to the purchaser and causing further damages will void this warranty.

Units where the serial no. has been altered, deleted, removed or made illegible will void this warranty.

Minor movement, expansion and contraction of the steel is normal and is not covered under the terms of this warranty.

FPI is not liable for the removal or replacement of facings or finishing in order to repair or replace any appliance in the field.

Freight damages for products or parts are not covered under the terms of the warranty.

Products made or provided by other manufacturers and used in conjunction with the FPI appliance without prior authorization from FPI may void this warranty.

Limitations of Liability:
The original purchaser's exclusive remedy under this warranty, and FPI's sole obligation under this warranty, express or implied, in contract or in tort, shall be limited to replacement, repair, or refund, as outlined above. IN NO EVENT WILL FPI BE LIABLE UNDER THIS WARRANTY FOR ANY INCIDENTAL OR CONSEQUENTIAL COMMERCIAL DAMAGES OR DAMAGES TO PROPERTY. TO THE EXTENT PERMITTED BY APPLICABLE LAW, FPI MAKES NO EXPRESS WARRANTIES OTHER THAN THE WARRANTY SPECIFIED HEREIN. THE DURATION OF ANY IMPLIED WARRANTY IS LIMITED TO DURATION OF THE EXPRESSED WARRANTY SPECIFIED ABOVE. IF IMPLIED WARRANTIES CANNOT BE DISCLAIMED, THEN SUCH WARRANTIES ARE LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

Some U.S. states do not allow limitations on how long an implied warranty lasts, or allow exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

Customers located outside the U.S. should consult their local, provincial or national legal codes for additional terms which may be applicable to this warranty.

How to Obtain Warranty Service:
Customers should contact the authorized selling dealer to obtain all warranty and service. In the event the authorized selling dealer is unable to provide warranty / service, please contact FPI by mail at the address listed on the next page. Please include a brief description of the problem and your address, email and telephone contact information. A representative will contact you to make arrangements for an inspection and/or warranty service, by an alternative dealer.

Product Registration and Customer Support:
Thank you for choosing a Regency Fireplace. Regency strives to be a world leader in the design, manufacture, and marketing of hearth products. To provide the best support for your product, we request that you complete a product registration form at http://www.regency-fire.com/Customer-Care/Warranty-Registration.aspx within ninety (90) days of purchase.

Product Registration and Customer Support:

Thank you for choosing a Regency Fireplace. Regency strives to be a world leader in the design, manufacture, and marketing of hearth products. To provide the best support for your product, we request that you complete a product registration form found on our Web Site under Customer Care within ninety (90) days of purchase.

For purchases made in **CANADA or the UNITED STATES**:
http://www.regency-fire.com/Customer-Care/Warranty-Registration.aspx

For purchases made in AUSTRALIA:
http://www.regency-fire.com.au/Customer-Care/Warranty-Registration.aspx

You may also complete the warranty registration form below to register your Regency Fireplace Product and mail and/or fax it back to us, and we will register the warranty for you. It is important you provide us with all the information below in order for us to serve you better.

Warranty Registration Form (or Register online immediately at the above Web Site):

Warranty Details	
Serial Number (required):	
Purchase Date (required) (mm/dd/yyyy):	
Product Details	
Product Model (required):	
Dealer Details	
Dealer Name (required):	
Dealer Address:	
Dealer Phone #:	
Installer:	
Date Installed (mm/dd/yyyy):	
Your Contact Details (required)	
Name:	
Address:	
Phone:	
Email:	

For purchases made in CANADA:

FPI Fireplace Products International Ltd.
6988 Venture St.
Delta, British Columbia
Canada, V4G 1H4

Phone: 604-946-5155
Fax: 1-866-393-2806

For purchases made in the UNITED STATES:

Fireplace Products US, Inc.
PO Box 2189 PMB 125
Blaine, WA
United States, 98231

Phone: 604-946-5155
Fax: 1-866-393-2806

For purchases made in AUSTRALIA:

Fireplace Products Australia Pty Ltd
1- 3 Conquest Way
Hallam, VIC
Australia, 3803

Phone: +61 3 9799 7277
Fax: +61 3 9799 7822

For fireplace care and tips and answers to most common questions please visit our Customer Care section on our Web Site. Please feel free to contact your selling dealer if you have any questions about your Regency product.

Installer: Please complete the following information

Dealer Name & Address:____

____

Installer: ____

Phone #: ____

Date Installed: ____

Serial #:____

Printed in Canada

REGENCY®
FIREPLACE PRODUCTS

Hampton™
HI2450 Wood Fireplace Insert

Owners & Installation Manual

www.regency-fire.com
French Manual: https://bit.ly/3t7JcJu
Manuel en Français : https://bit.ly/3t7JcJu

MODEL: HI2450

Tested & listed by:
O-TL
C US
0219WN026S

***Installer*: Please complete the details on the back cover and leave this manual with the homeowner.**
***Homeowner:* Please keep these instructions for future reference.**

Thank you for purchasing a
REGENCY FIREPLACE PRODUCT.

The pride of workmanship that goes into each of our products will give you years of trouble-free enjoyment. Should you have any questions about your product that are not covered in this manual, please contact the **REGENCY DEALER** in your area.

"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." Failure to follow the manual details can lead to smoke and CO emissions spilling into the home. It is recommended to have monitors in areas that are expected to generate CO such as heater fueling areas.

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cord wood." Tested & listed to ASTM E3053. Model Regency HI2450 1.4g/hr.

"This manual describes the installation and operation of the Regency HI2450 wood heater. This heater meets the 2020 U.S. Environmental Protection Agency's cord wood emission limits for wood heaters. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 14,200 Btu/hr. to 34,600 Btu/hr." Efficiency is determined using the B415 method resulting in lower and higher heat values. This heater generates the best efficiency when operated using well-seasoned wood and installed in the main living areas where the majority of the chimney is within the building envelope. "

It is against federal regulation to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if elements are deactivated or removed."

CAUTION: BURN UNTREATED WOOD ONLY. OTHER MATERIALS SUCH AS WOOD PRESERVATIVES, METAL FOILS, COAL, PLASTIC, GARBAGE, SULPHUR OR OIL MAY DAMAGE THE HEATER.

"This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods."

DO NOT BURN:

- Treated wood
- Coal
- Garbage
- Cardboard
- Solvents
- Colored Paper
- Trash
- **Lawn clippings or yard waste**
- **Materials containing rubber including tires**
- **Materials containing plastic**
- **Waste petroleum products , paints or paint thinners or asphalt products**
- **Materials containing asbestos**
- **Construction or demolition debris**
- **Railroad ties**
- **Manure or animal remains**
- **Saltwater driftwood or other previously salt water saturated materials**
- **Unseasoned wood**
- **Paper products, cardboard, plywood or particle board. 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 a wood heater.**

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

The authority having jurisdiction (such as Municipal Building Department, Fire Department, Fire Prevention Bureau, etc.) should be consulted before installation to determine the need to obtain a permit.

This unit must be connected to either a listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the United States of America. or code approved masonry chimney with flue liner.

HI2450 is tested and certified to ULC-S628-93 (R1997) and UL1482-2011 (R2015).

SAVE THESE INSTRUCTIONS

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

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

Wood Energy Technical Training

WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov

919-874

safety label

dimensions

installation

operation

maintenance

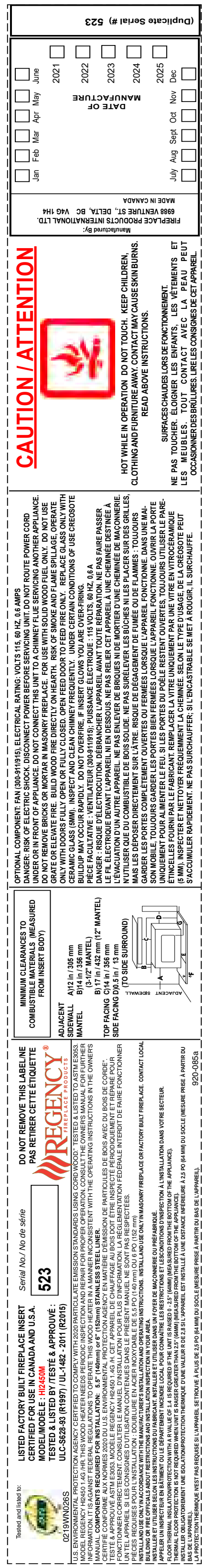
parts

CAUTION: To avoid burns or wood splinters, when opening/closing the fuel door or adding wood to the fire, You should always wear appropriate protective gloves to protect your hands from the heat being emitted from this fireplace.

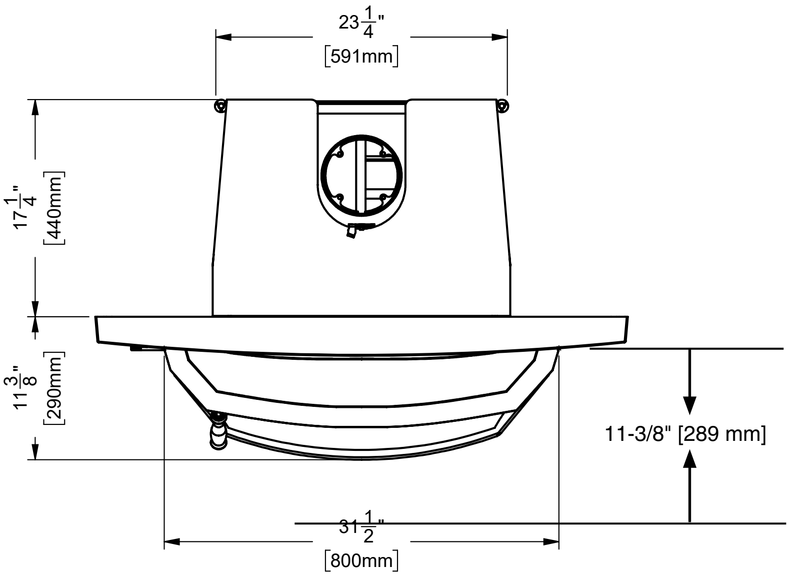
Safety Label for HI2450

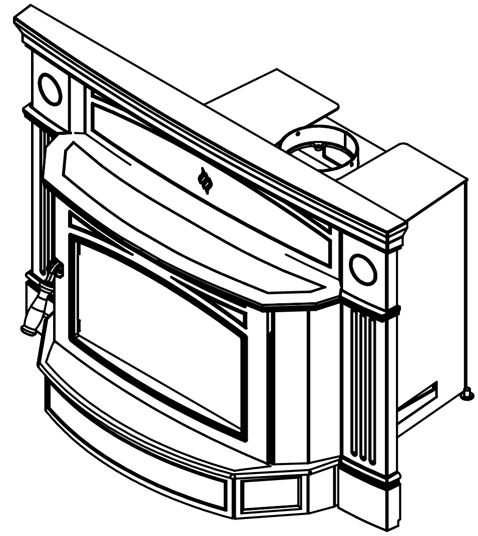
This is a copy of the label that accompanies your **Regency Insert**. We have printed a copy of the contents here for your review.

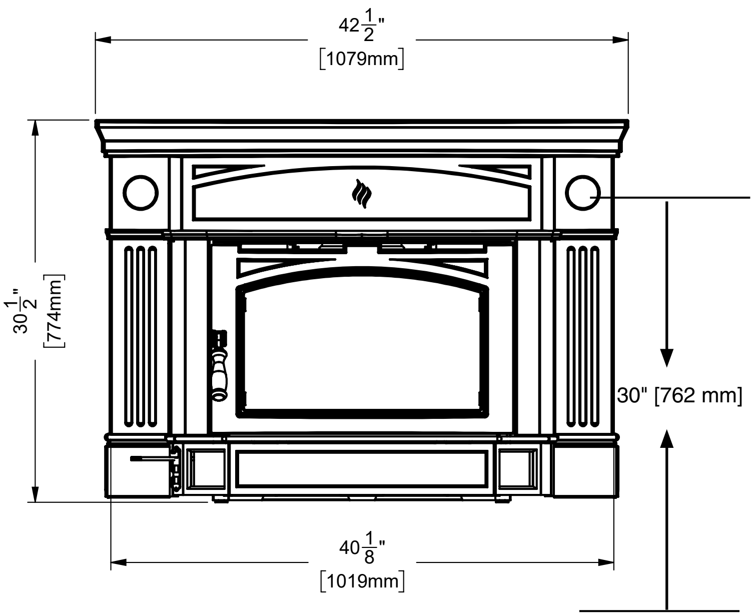
NOTE: Regency units are constantly being improved. Check the label on the unit and if there is a difference, the label on the unit is the correct one.

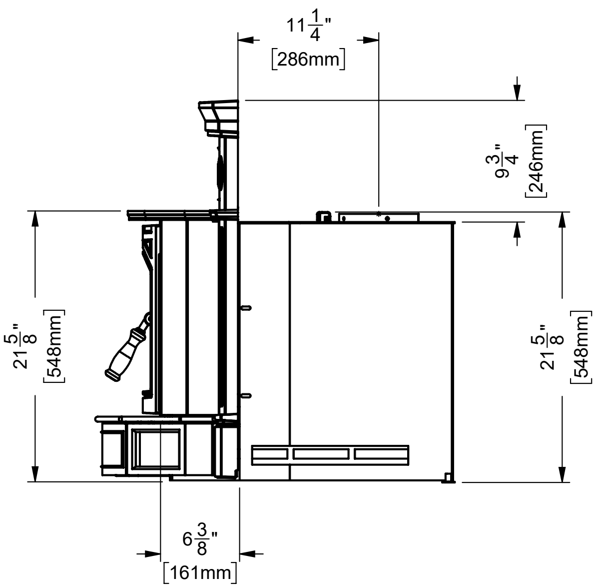


Dimensions with Regular Faceplate



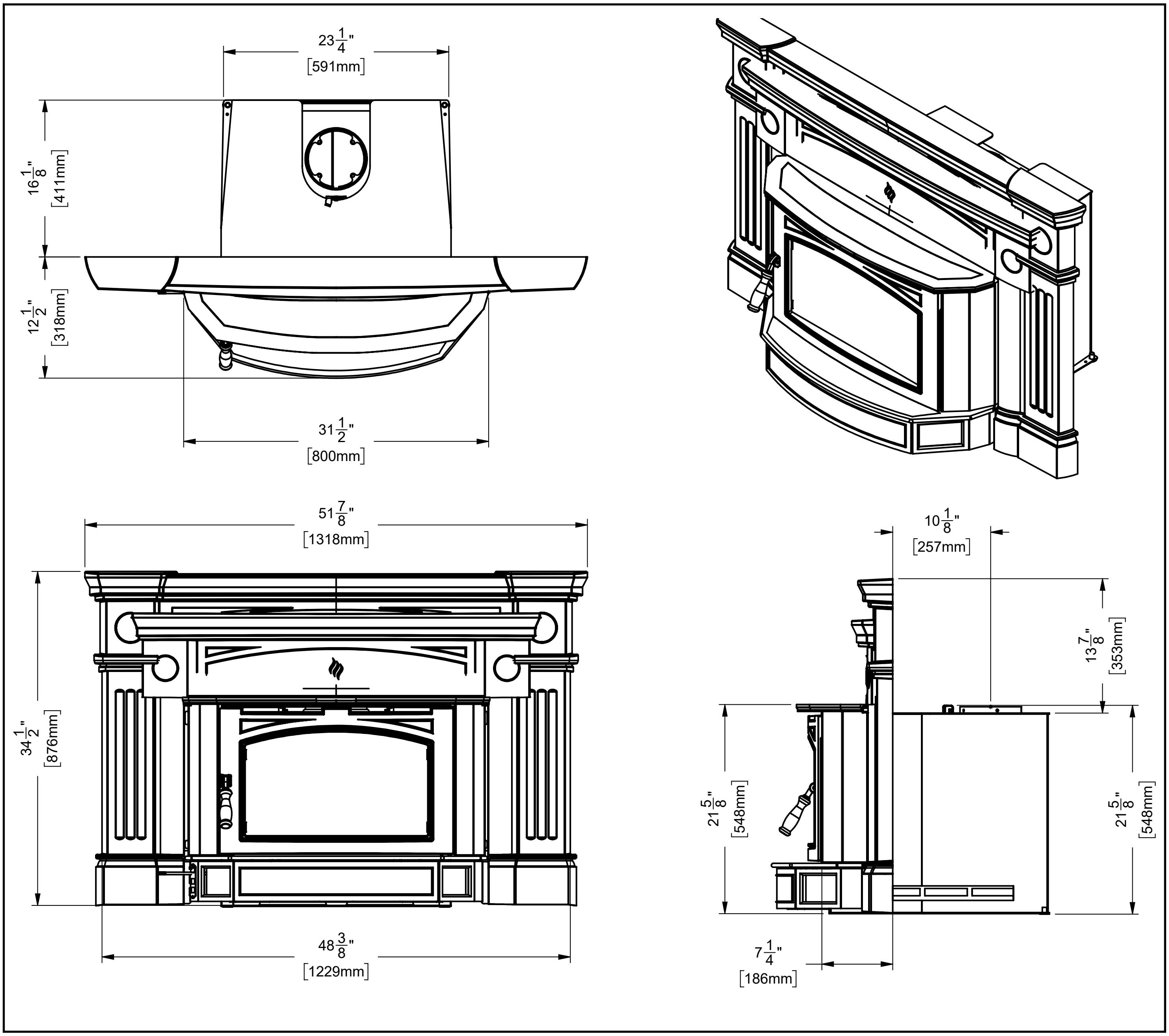






ALL PICTURES / DIAGRAMS SHOWN THROUGHOUT THIS MANUAL ARE FOR ILLUSTRATION PURPOSES ONLY. ACTUAL PRODUCT MAY VARY DUE TO PRODUCT ENHANCEMENTS.

Dimensions with Oversize Faceplate

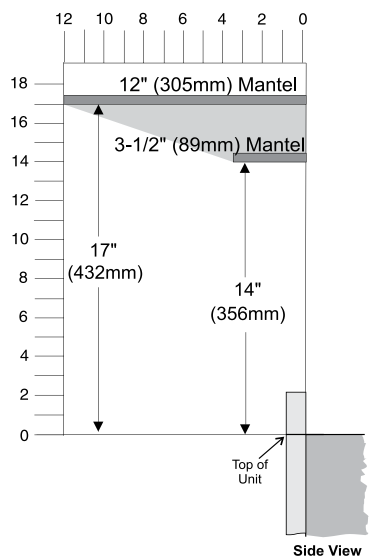


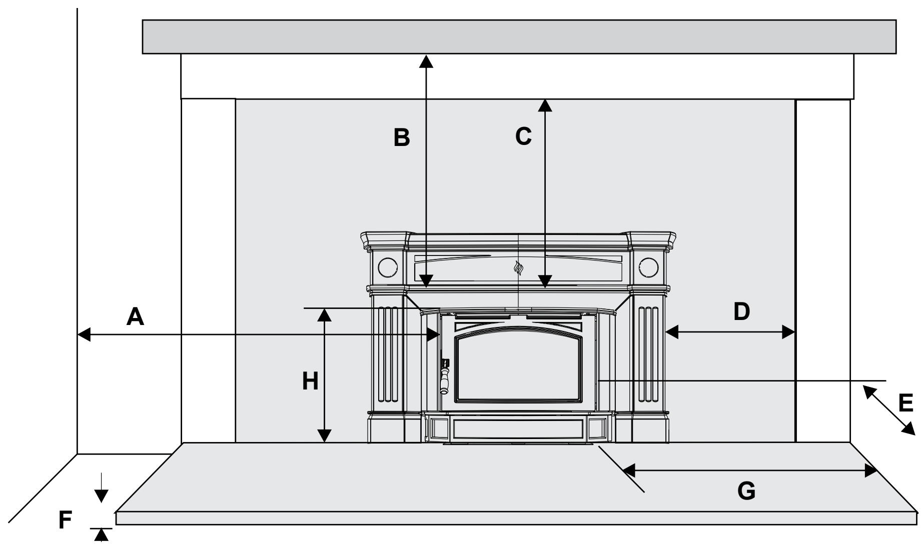
Masonry and Factory Built Fireplace Clearances

The minimum required clearances to combustible materials when installed into a masonry or factory built fireplace are listed below.

Unit HI2450	Adjacent Side Wall (to Side) A	Mantle ** (to Top of Unit) B	Top Facing (to Top of Unit) C	Side Facing D	Minimum Hearth Extension* E	Minimum Hearth Thickness F	Minimum Hearth Side Extension* G	To Top of Unit H
	12" (305 mm)	14"(356 mm) for 3-1/2" (89 mm) mantel	14" (356 mm)	1/2" (13 mm) to side surround	16" (406 mm) USA	1/2" (13 mm)	8" (203 mm)	21-5/8" (548 mm)
		17"(432 mm) for 12" (305 mm) mantel			18"(457 mm) Canada			

Side and Top facing is a maximum of 1-1/2" (38mm) thick.





Clearance Diagram for Installations

Clearances are critical.

**Mantel can be installed anywhere in shaded area or higher using the above scale.

Note: Ensure the paint that is used on the mantel and the facing is "heat resistant" or the paint may discolour.

Wood Insert Specifications

Your fireplace opening requires the following minimum sizes:

Height: 21.5"
Width: 25"
Depth: 17"

Two faceplates are available to seal the fireplace opening:

Standard	Oversize
40" W x 30" H (narrowest point)	48" W x 34-9/16" H
42-1/2" W x 30" H (widest point)	51-7/8" W x 34-9/16" H

*Floor Protection

Floor thermal insulation/protection with a R value of 1.4 is required if the unit is raised 0 - 2.5" (0-64mm) (measured from the bottom of the appliance).

Thermal floor protection is not required when unit is raiser greater than 2.5" (64mm) (measured from the bottom of the appliance).

Please check to ensure that your floor protection and hearth will meet the standards for clearance to combustibles. Your hearth extension must be made from a non-combustible material. Extending 16" for US and 18" for Canada—measured from the fuel loading door.

Installation into a Masonry Fireplace

Regency Inserts are constructed with the highest quality materials and assembled under strict quality control procedures that insure years of trouble free and reliable performance.

It is important that you read this manual thoroughly and fully understand the safe installation and operating procedures. The more you understand the way your Regency Insert operates, the more enjoyment you will experience from knowing that your unit is operating at peak performance.

Before Installing Your Insert

1. Please read this entire manual before you install and use your new wood insert. Failure to follow instructions may result in property damage, bodily injury or even death. Install and use only in accordance with manufacturer's installation and operating instructions.

2. Check your local building codes - Building Inspection Department. You may require a permit before installing your insert. **Be aware that local codes and regulations may override some items in the manual.**

   WARNING: Careless installation is the major cause of safety hazard. Check all local building and safety codes before installation of unit.

3. Notify your home insurance company that you plan to install a fireplace insert or hearth heater.

4. Your fireplace insert is heavy and requires two or more people to move it safely. The insert can be badly damaged by mishandling.

5. If your existing fireplace damper control will become inaccessible once you have installed your Regency Insert, you should either remove or secure it in the open position.

6. Inspect your fireplace and chimney prior to installing your insert to determine that it is free from cracks, loose mortar or other signs of damage. If repairs are required, they should be completed before installing your insert. Do not remove bricks or mortar from your masonry fireplace.

7. **Do not connect the insert to a chimney system servicing another appliance or an air distribution duct.**

When referencing installation or connection to masonry fireplaces or chimneys, the masonry construction must or shall be code complying.

Chimney Specifications

Before installing, check and clean your chimney system thoroughly. If in doubt about its condition, seek professional advice. Your Regency Insert is designed for installation into a masonry fireplace that is constructed in accordance with the requirements of "The Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliance", N.F.P.A. 211, the National Building Code of Canada, or the applicable local code requirements.

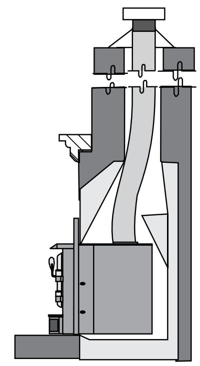
The appliance, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70, or the Canadian Electrical code, CSA C22.1.

Regency Inserts are designed to use either a 5.5" (140mm) or 6" (152mm) flue.

In Canada this fireplace insert must be installed with a continuous chimney liner of 5.5" (140mm) or 6" (152mm) diameter extending from the fireplace insert to the top of the chimney. The chimney liner must conform to the Class 3 requirements of CAN/ULC-S635 or CAN/ULC-S640, Standard for Lining Systems for New Masonry Chimneys.

In the U.S.A., a 5.5 inch (140 mm) or 6 inch (152 mm) diameter, stainless steel, full height chimney liner that meets type HT (2100^0 F) requirements per UL 1777 must be installed. The full liner must be attached to the insert flue collar and to the top of the existing masonry chimney.

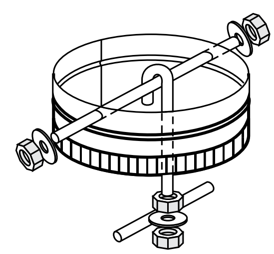
Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may cause damage. An uncontrollable burn or excessive temperature indicates excessive draft. Inadequate draft may cause back puffing 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. Ensure the heater is installed in areas that are not too close to neighbors or in valleys that would cause unhealthy air quality or nuisance conditions.



Optional Flue Connector Kit

The Straight Flue Adaptor (Part #846-504) shown here, may be used to produce a secure connection between your flue connector and the insert collar. Detailed installation instructions are included with the kit.

The following may also be purchased separately if required to complete the install:
846-506 6" Flue Adapter 30 degree
846-508 6" Flue Adapter 45 degree
948-412/P 6" Flue Offset Adapter (offsets back 4")
846-527 Flue Connector Kit



Straight adaptor shown with flue connector kit

Installation Into a Factory Built Fireplace

Regency inserts are constructed with the highest quality materials and assembled under strict quality control procedures that ensure years of trouble free and reliable performance.

It is important that you read this manual thoroughly and fully understand the installation and operating procedures. Failure to follow instructions may result in property damage, bodily injury or even death. The more you understand the way your Regency Insert operates, the more enjoyment you will experience from knowing that your unit is operating at peak performance.

Requirements for Installing Solid-fuel Inserts in Factory-built Fireplaces

1. A permit may be required for installations, final approval is contingent of the authority having local jurisdiction. Consult insurance carrier, local building, fire officials or authorities having jurisdiction about restrictions, installation inspection, and permits.
2. Inspect the existing fireplace and chimney for any damage or flaws such as burnouts, metal or refectory warping.
3. Inspection to a minimum of NFPA 211 Level II is recommended. All repairs must be made prior to installing an insert. The fireplace must be structurally sound and be able to support the weight of the solid-fuel insert.
4. The factory-built chimney must be listed per UL 127 or ULC 610-M87 for all installations. Install thermal protection as per this appliance listing requirements.
5. A full height 5.5 inch (140 mm) or 6 inch (152 mm) diameter stainless steel full height listed chimney liner must be installed meeting type HT (2100°F) requirements per UL 1777 (USA) or ULC S635 with "0" clearance to masonry (Canada). The full liner must be attached to the insert flue collar and to the top of the existing chimney.
6. The flue liner top support attachment must not reduce the air flow for the existing air-cooled chimney system. Reinstall original factory-built chimney cap only.
7. To prevent room air passage to the chimney cavity of the fireplace, seal either the damper area around the chimney liner or the insert surround. Circulating air chamber (i.e. in a steel fireplace liner or metal hearth circulatory) may not be blocked. The air flow within and around the fireplace shall not be altered, blocked by the installation of the insert (i.e. not louvers or cooling air inlet or outlet ports may be blocked by the insert or the insert surround).
8. Means must be provided for removal of the insert to clean the chimney flue.
9. Inserts that project in front of the fireplace must be supplied with appropriate supporting means.
10. Installer must mechanically attach the supplied label to the inside of the firebox of the fireplace into which the insert is installed.

WARNING

Fire Risk.
When lining air-cooled factory-built chimneys:
- Run chimney liner approved to **UL 1777 Type HT requirements (2100°F)**
- Reinstall original factory-built chimney cap ONLY
- DO NOT block cooling air openings in chimney
- Blocking cooling air will overheat the chimney

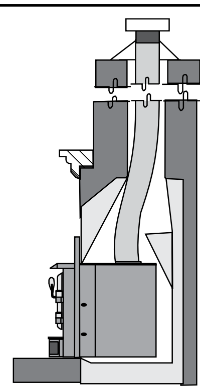
Altering the Fireplace

The following modifications of factory-built fireplaces are permissible:

The following parts may be removed:	
Damper	Smoke Shelf or Baffle
Ember Catches	Fire Grate
Viewing Screen/ Curtain	Doors

- The fireplace must be altered. Cutting any sheet metal parts of the fireplace in which the fireplace insert is to be installed is prohibited, except that the damper may be removed to accomodate a direct-connect starter pipe or chimney liner.
- External trim pieces which do not affect the operation of the fireplace may be removed providing they can be stored on or within the fireplace for reassembly if the insert is removed.
- The permanent metal warning label provided in the component pack must be attached to the back of the fireplace, with screws or nails, stating that the fireplace may have been altered to accomodate the insert, and must be returned to original condition for use as a conventional fireplace.
- If the hearth extension is lower than the fireplace opening, the portion of the insert extending onto the hearth must be supported.
- Manufacturer designed adjustable support kit can be ordered from your dealer.
- Final approval of this installation type is contingent upon the authority having jurisdiction.

WARNING: This fireplace may have been altered to accommodate an insert. It must be returned to its original condition before use as a solid fuel burning fireplace.



1. When installed in a factory built fireplace, a full stainless steel rigid or flexible flue liner is mandatory, for both safety and performance purposes. When a flue or liner is in use, the insert is able to breathe better by allowing a greater draft to be created. The greater draft can decrease problems such as, difficult start-ups, smoking out the door, and dirty glass.

2. In order to position the flue liner, the existing rain cap must be removed from your chimney system. In most cases the flue damper should also be removed to allow passage of the liner.

3. In most cases opening the existing spark screens fully should give enough room for the insert installation. If it does not, remove and store.

4. If the floor of your fireplace is below the level of the fireplace opening, adjust the insert's levelling bolts to accommodate the difference. When additional shimming is required, use non-combustible masonry or steel shims.

5. Measure approximately the alignment of the flue liner with the position of the smoke outlet hole on the insert to check for possible offset. If an offset is required, use the appropriate offset adaptor in your installation.

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 and may cause damage. An uncontrollable burn or excessive temperature indicates excessive draft. Inadequate draft may cause back puffing 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. Ensure the heater is installed in areas that are not too close to neighbors or in valleys that would cause unhealthy air quality or nuisance conditions.

STOP! PLEASE READ CAREFULLY.

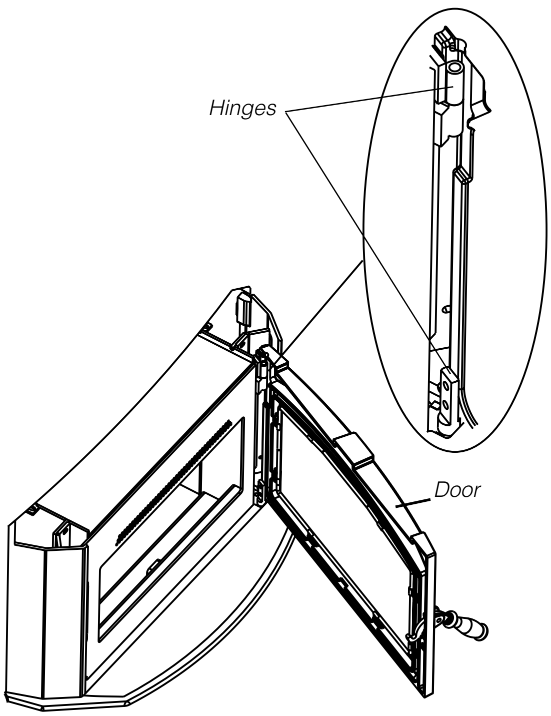
CAST COMPONENTS ARE VERY FRAGILE. USE EXTREME CARE WHEN HANDLING.

Installing Your Insert

Your insert is very heavy and will require two or three people to move it into position.

1. Remove the door to make the insert easier to handle. To remove the Door, open fully and lift it up off its hinges.

   Refer to the Door Removal section for an important note on installation.

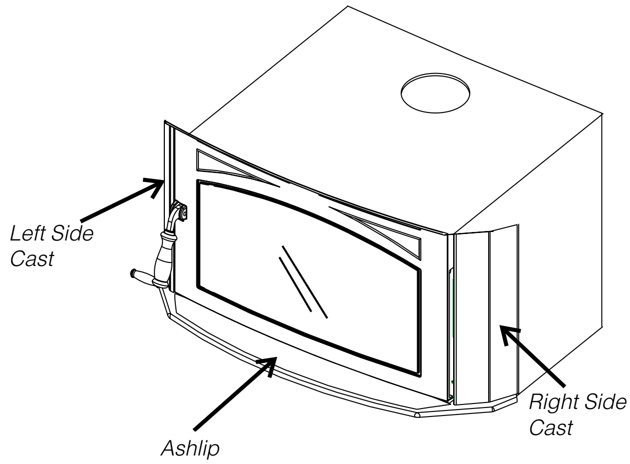


2. **NOTE:** For Masonry installation make sure that the firebox is level with the hearth using non-combustible materials and no more than 1/2 to 1 inch of the levelling bolt.

3. Lift the unit up onto the Hearth and slide into the fireplace opening. Be sure to leave the unit out at least 3 to 4 inches in order to make the necessary flue connections and to install the faceplate.

   Be sure to protect your hearth extension during the installation, ie. with a heavy blanket.

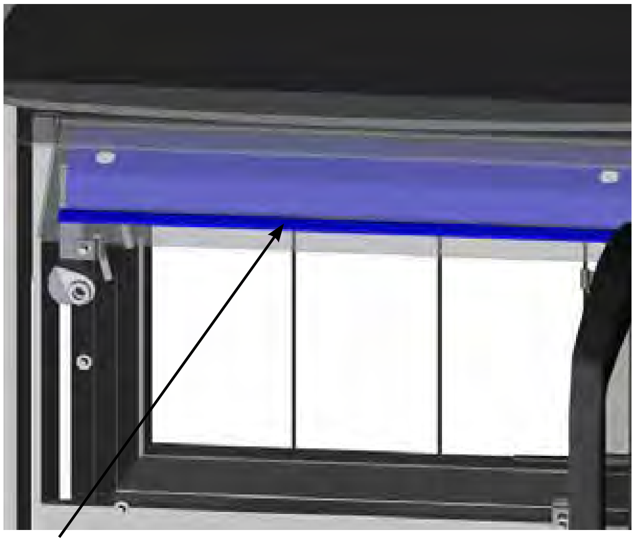
WARNING
DO NOT LIFT OR PUSH THE UNIT FROM THE ASHLIP, LEFT SIDE CAST or RIGHT SIDE CAST. THE CASTING WILL CHIP OR BREAK.



DO NOT LIFT UNIT FROM THESE PARTS.

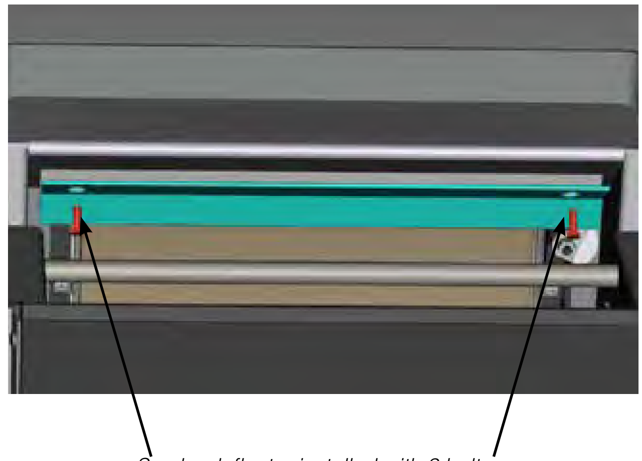
Stainless Steel Smoke Deflector Installation

The stainless smoke deflector is located in the upper front area of the firebox. The deflector is held in place with 2 bolts
Prior to the first fire, ensure deflector is seated properly and secured with 2 hand tightened bolts.



Smoke Deflector

Smoke deflector is installed through the door opening in location shown in diagram



Smoke deflector installed with 2 bolts.

Note: *This is a view from the back of the unit through the top.*

To replace the deflector, loosen off both bolts and slide deflector upward and out. Install new deflector and hand tighten bolts. Ensure positive location of the deflector prior to hand tightening.

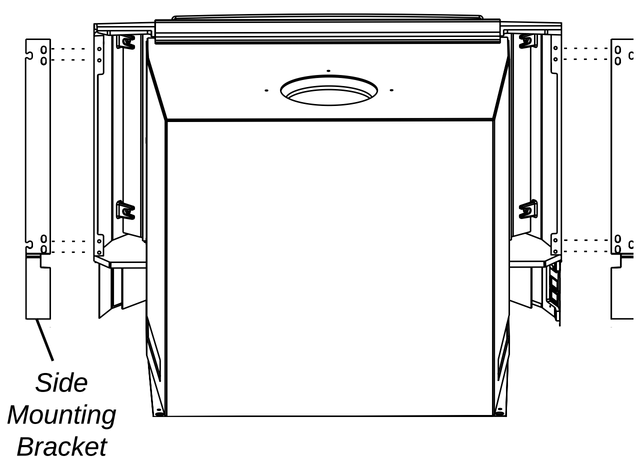
WARNING: Operation of the unit with out proper installation of smoke deflector will void warranty.

Ensure deflector is seated so bolts are situated at the top of the keyhole before tightening.

Standard Cast Faceplate Installation

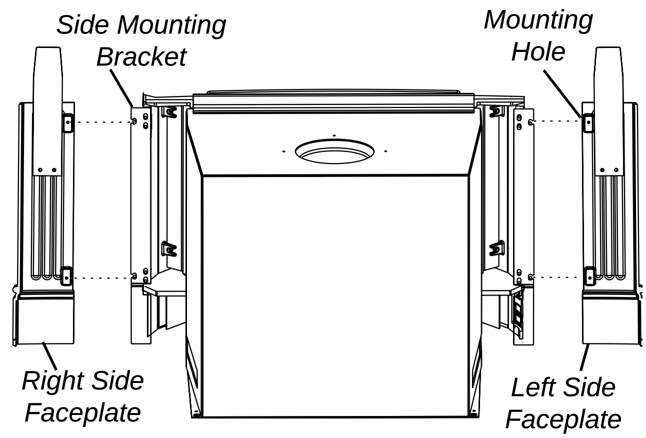
FACEPLATE CONTENTS LIST	
Qty	Description
1	Left Side Faceplate
1	Right Side Faceplate
1	Top Faceplate
2	Side Mounting Brackets
4	1/4" - 20 x 1/2" Hex Head Bolts
4	1/4" Lock Washers
4	1/4" Flat Washers
2	47" Insulations

1) Secure the Side Mounting Brackets (packaged with Faceplate) to the left and right side of the f rebox using 4 bolts per mounting bracket as shown in the diagram below.



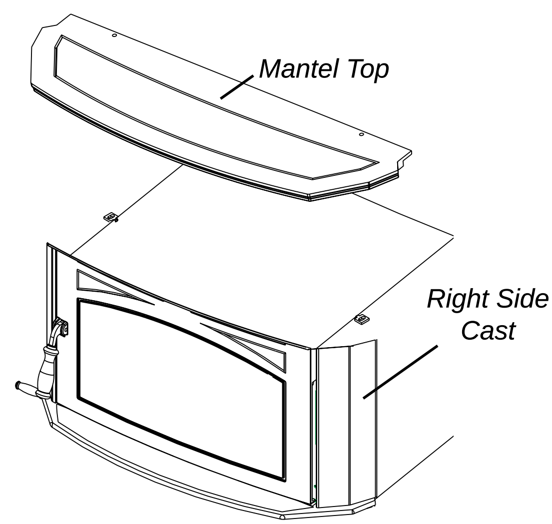
Backside of Unit Shown.

2) Secure the Left and Right Side Faceplate to the f rebox by aligning the Mounting Holes with the Side Mounting Brackets taking care to align vertically while each side rests on the hearth. Secure using 1 bolt per bracket.



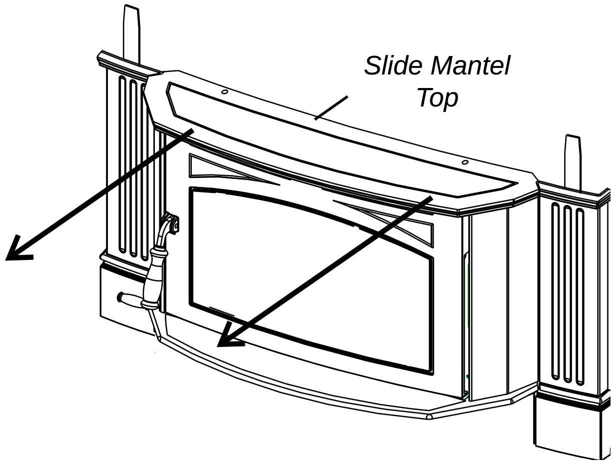
Backside of Unit & Faceplate Shown.

3) Place Mantel Top onto the top of the f rebox.



With the Mantel Top in place check to make sure there is no gap between the nut retainer and the underside cast of the Mantel Top. If there is a gap present you will need to lower that side cast by loosening 2 bolts, see step 6 for bolt location (check to see if level).

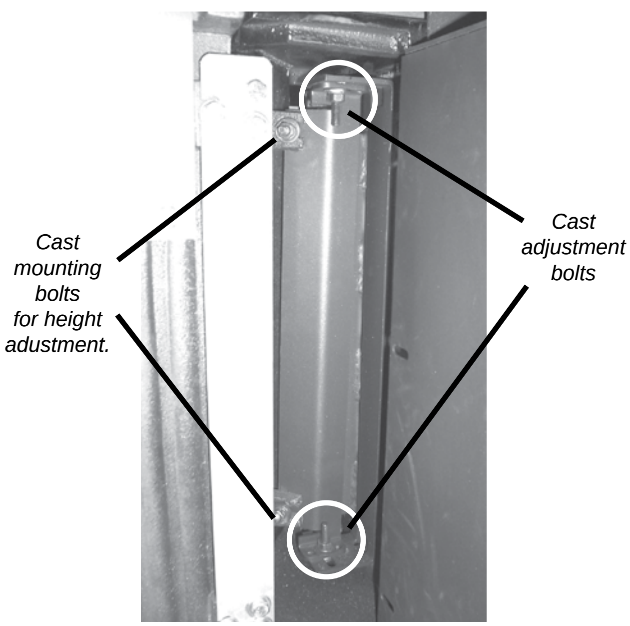
4) Slowly slide the Mantel Top forward until it stops.



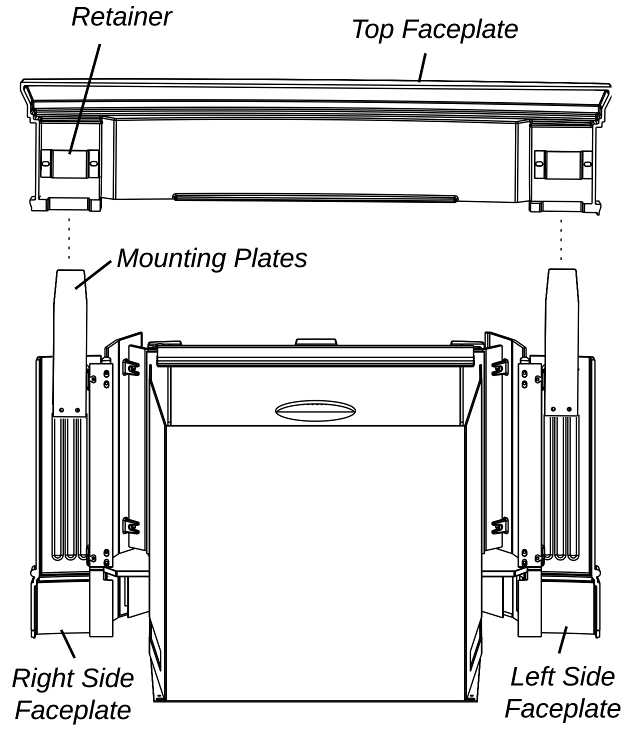
5) Mount the Top Faceplate by carefully sliding the Mounting Plates on the Left and Right Side Faceplate thru the Retainers in the Top Faceplate.

NOTE: Slowly lower the Top Faceplate into position; being careful not to damage the Mantel Top.

6) If unable to align side faceplate to unit and top faceplate further adjustments need to be made, **complete one side at a time**. Loosen all bolts on brackets (6 per side). Loosen top and bottom bolts (Shown below). Adjust left or right side cast plates to allow further adjustment on faceplate. Once aligned, hold side surround in place and tighten all bolts. If side cast height needs adjusting, loosen 2 bolts holding cast bracket and adjust up or down.

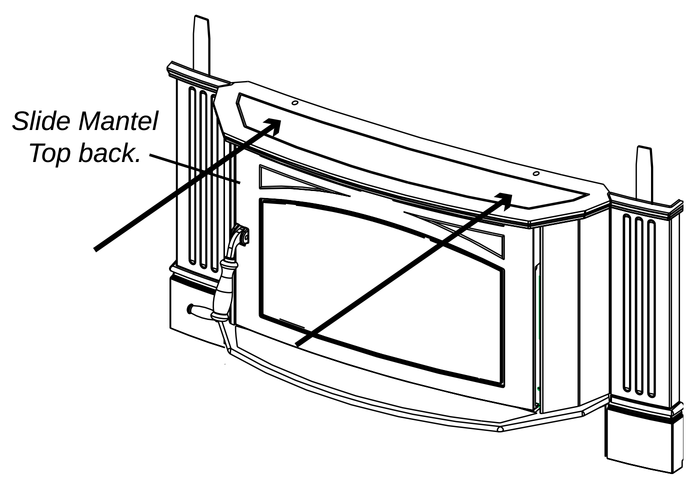


See Step 3 to identify side casts.
See next page for recommended measurements.



Backside of Unit & Faceplate Shown.

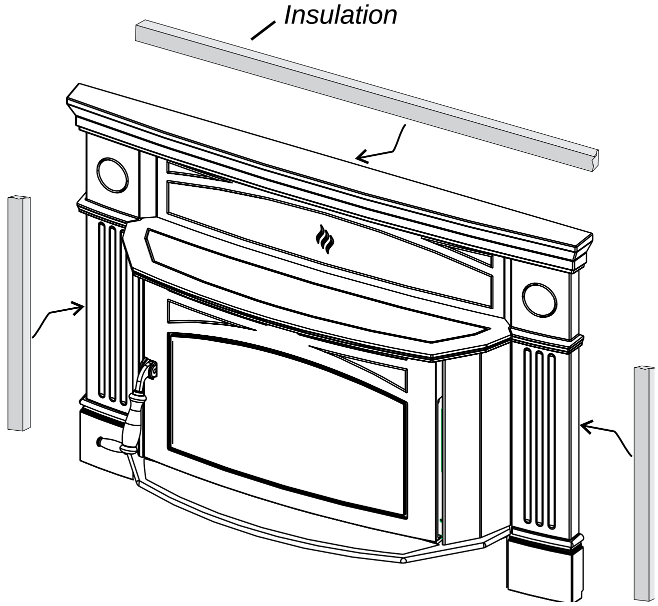
7) Carefully slide the Mantel Top back into position.



8) Location of Insulation:

a) Place 1 piece of Insulation behind the Mantel Top.

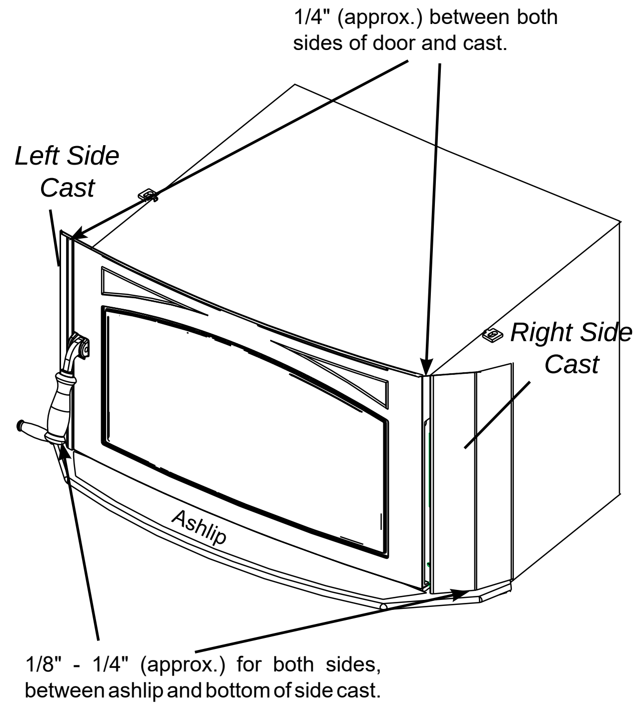
b) Cut the second piece of Insulation in half, then install behind both the Left and Right Sides as shown.

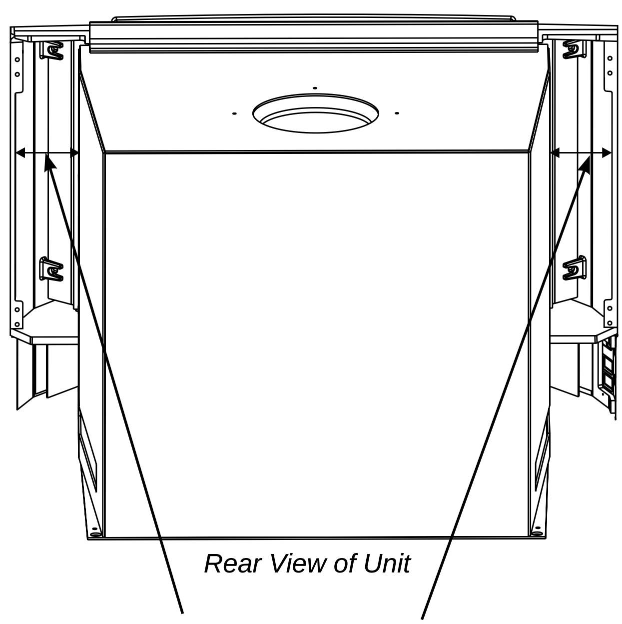


9) The unit may now carefully be slid into f nal position.

RECOMMENDED MEASUREMENTS FOR SETTING SIDE CASTS

Stop! Read Carefully.
Enamel & Cast components are very fragile.
Use extreme care when handling.





Important: Verify gap between cast and door did not change when rear adjustments have been made. Carefully open door slowly, to ensure that the door does not rub against cast sides.

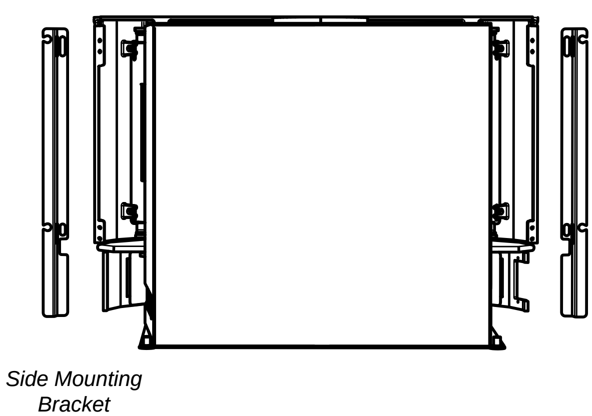
* **These are just recommended measurements.**

Oversize Cast Faceplate Installation

Stop! Read Carefully.
Enamel & Cast components are very fragile. Use extreme care when handling.

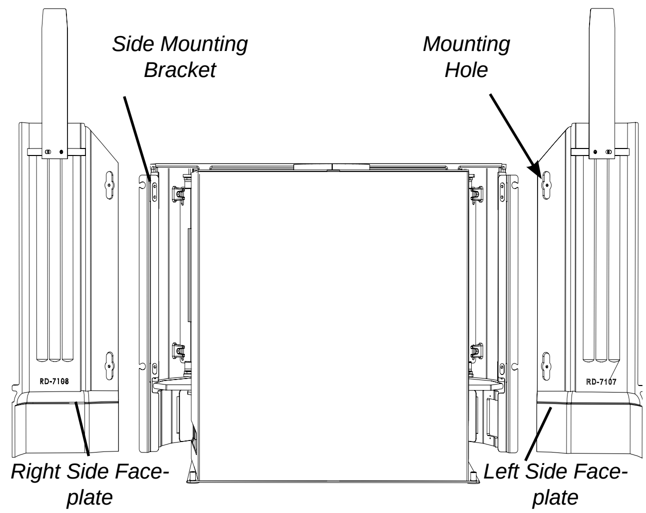
FACEPLATE CONTENTS LIST	
Qty	**Description**
1	Left Side Faceplate
1	Right Side Faceplate
1	Top Faceplate
2	Side Mounting Brackets
2	1/4" - 20 x Hex Nuts
2	1/4" - 20 x 1" Hex Head Bolts
2	1/4" Flat Washers
2	47" Insulations
1	8 mm gasket

1) Secure the Side Mounting Brackets (packaged with Faceplate) to the left and right side of the f rebox using 2 bolts per mounting bracket as shown in the diagram below. Bolts are pre-installed on unit. Leave bolts loose until f nal adjustment is made.



Backside of Unit Shown.

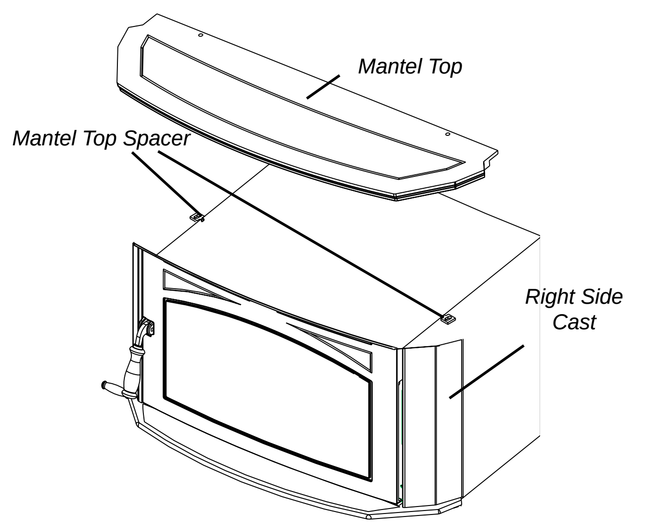
2) Secure the Left and Right Side Faceplate to the f rebox by aligning the Mounting Holes with the Side Mounting Brackets taking care to align vertically while each side rests on the hearth. Secure using 2 bolts per bracket.



Backside of Unit & Faceplate Shown.

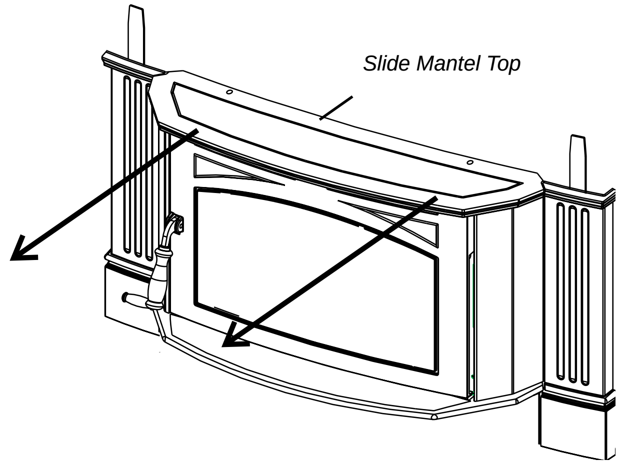
3) Place 1/4" x 1" Hex head bolt with 2 washers in Mantel Top Spacer locations shown below.

4) Place Mantel Top onto the top of the f rebox.



With the Mantel Top in place check to make sure there is no gap between the Mantel Top Spacer and the underside cast of the Mantel Top. If there is a gap present you will need to lower that side cast by loosening 2 bolts, see side cast adjustment section for bolt location (check to see if level).

5) Slowly slide the Mantel Top forward until it stops.

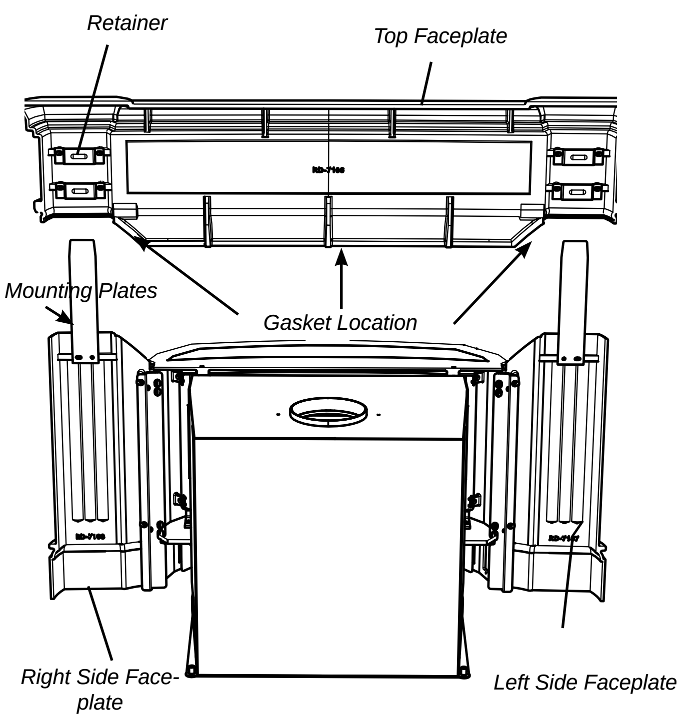


6) Place supplied gasket to bottom edge of top faceplate - continue gasket up each side at a 45° angle.

7) Mount the Top Faceplate by carefully sliding the Mounting Plates on the Left and Right Side Faceplate through the Retainers in the Top Faceplate.

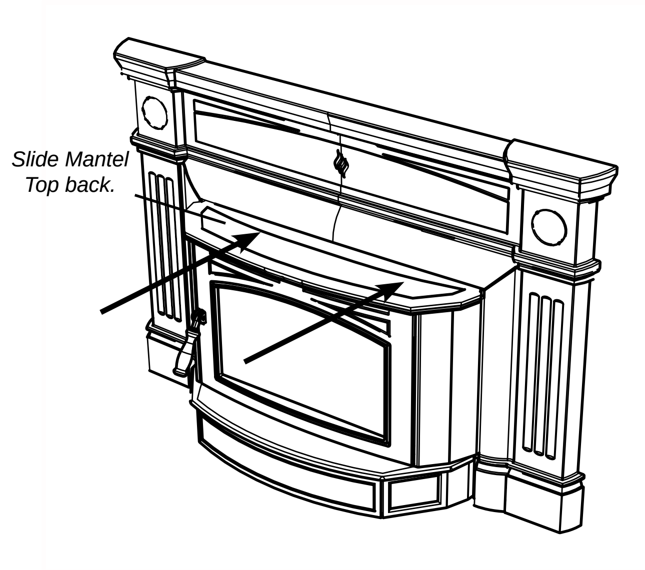
NOTE: Slowly lower the Top Faceplate into position; being careful not to damage the Mantel Top.

NOTE: Installing the top faceplate will require 2 people - it is heavy and awkward to handle.



Backside of Unit & Faceplate Shown.

8) Carefully slide the Mantel Top back into position.

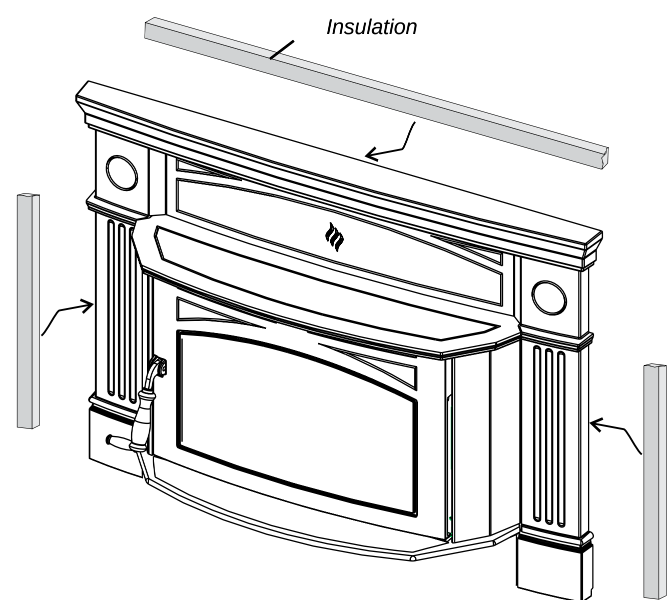


9) Adjust Left Side Faceplate and tighten bolts. Repeat step for Right Side Faceplate.

10) Location of Insulation:

a) Place 1 piece of Insulation behind the Mantel Top.

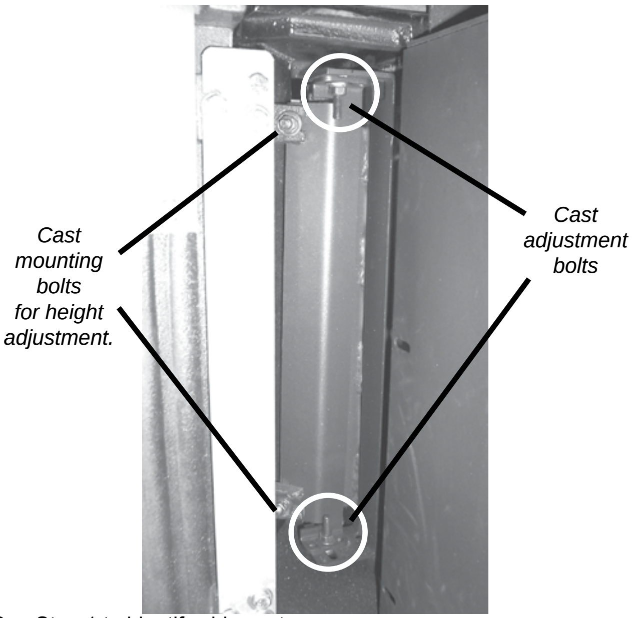
b) Cut the second piece of Insulation in half, then install behind both the Left and Right Sides as shown.



11) The unit may now carefully be slid into f nal position. See side cast adjustments if faceplate needs aligning.

SIDE CAST ADJUSTMENTS

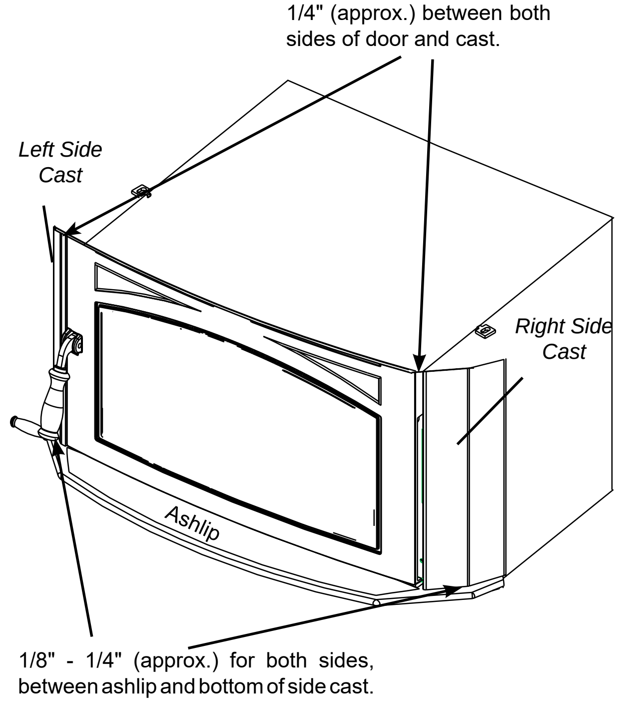
If unable to align side faceplate to unit and top faceplate further adjustments need to be made, **complete one side at a time**. Loosen all bolts on brackets (6 per side). Loosen top and bottom bolts (Shown below).
Adjust left or right side cast plates to allow further adjustment on faceplate. Once aligned, hold side surround in place and tighten all bolts. If side cast height needs adjusting, loosen 2 bolts holding cast bracket and adjust up or down.

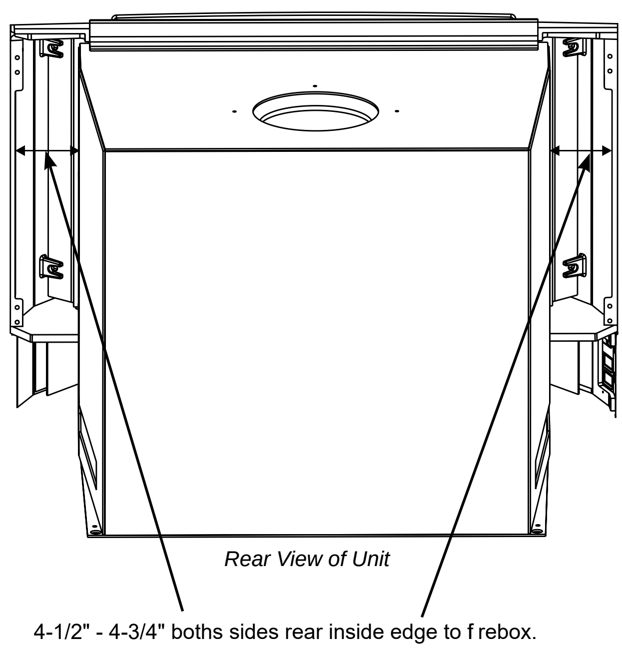


See Step 1 to identify side casts.
See next section for recommended measurements.

RECOMMENDED MEASUREMENTS FOR SETTING SIDE CASTS

Stop! Read Carefully.
Enamel & Cast components are very fragile.
Use extreme care when handling.





Important: Verify gap between cast and door did not change when rear adjustments have been made.
Carefully open door slowly, to ensure that the door does not rub against cast sides.

* **These are just recommended measurements.**

Cast Grill Installation

GLASS REMOVAL TO INSTALL OPTIONAL DOOR CAST GRILL

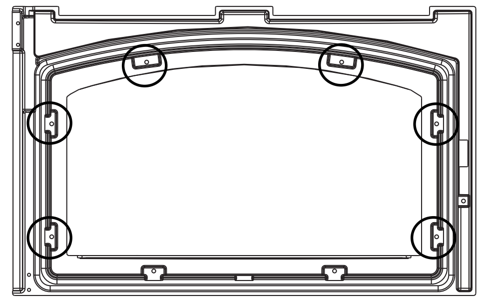
1. To remove the glass, loosen the two 7/16" bottom retainer bolts but do not remove.

2. Remove the sides and top retainer and bolts highlighted in the diagram and carefully remove glass, it will fall towards you at the top.

3. Place the grill in the door, make sure that the glass gasketing on the left and right bracket is facing you.

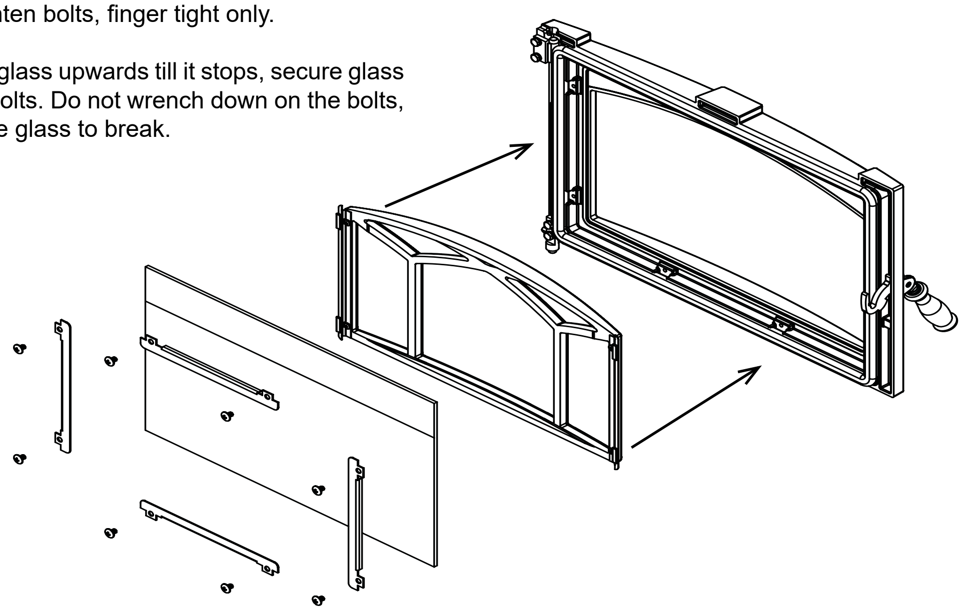
4. Carefully place the glass (black strip up) into the bottom retainer. Keeping it in place, re-install the sides and top retainer and bolts. Do not tighten bolts, finger tight only.

5. Lift the bottom of the glass upwards till it stops, secure glass retainer using the 8 bolts. Do not wrench down on the bolts, as this may cause the glass to break.



Remove 6 - 7/16" Bolts

Avoid impact on glass doors such as striking or slamming shut.



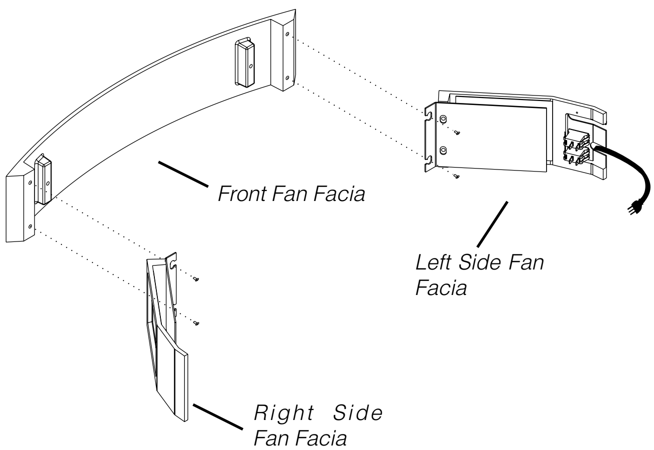
Fan Installation

Installer: Please record unit serial number here before installing blower.

Serial No.________________________________

Your fan should only be installed once the unit is in place in order to prevent any damage to the fan.

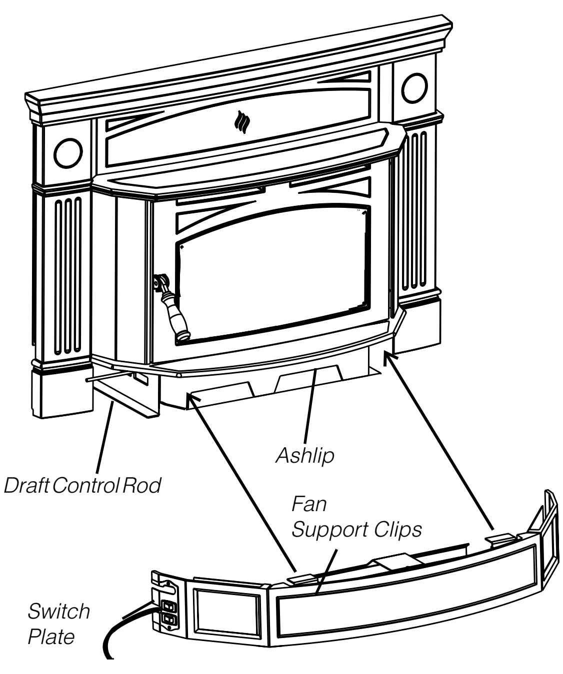
1. Attach the Left and Right Side Fan Facia to the Front Fan Facia by aligning the Side Facia screw slots with the hole locations in the Front Fan Facia and secure using 2 screws per side.



Backside of Fan Facia shown

2. Once the Fan Facia has been assembled carefully slide the Fan into position by centering the Fan below the Ashlip and align the Fan Support Clips with the Offset Clips under the Ashlip.

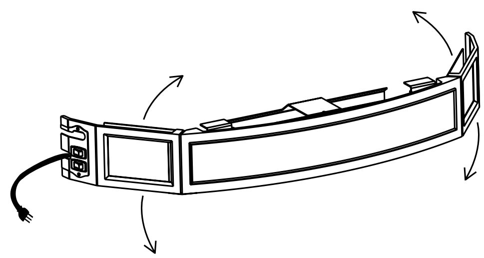
   Note: The Draft Control Rod is to fit through the top opening in the Switch Plate.



IMPORTANT

Ensure that the Left and Right Side Fan Facia do not hit the sides of the Faceplate when sliding the Fan into position as the casting may chip.

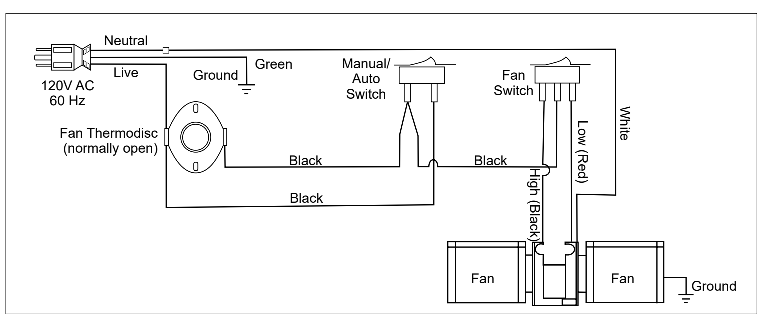
If the spacing between the Side Fan Facia and the Faceplate requires adjustment, the Side Fan Facia's can be slightly pushed in or pulled out to fit accordingly.



3. Ensure the power cord and all other wires will not come into contact with any hot stove surfaces.

DO NOT ROUTE POWER CORD UNDER OR IN FRONT OF UNIT.

Do not turn the fan ON until your insert has reached operating temperature or at least 30 minutes after starting fire.



Blower/Fan Wiring Diagram

Power Outlet Conversion

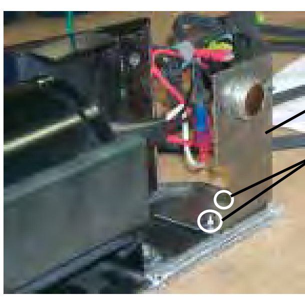
1) Remove the Phillips screw, located on the top of the fan housing, which attaches the fan deflector to the main fan body.

Fan Housing

2) Take o˜ the 2 screws from the fan switch plate assembly, and remove it from the left casting face.

Fan Switch Plate Assembly

3) Take o˜ the 2 bolts, nuts, and washers from the thermodisc assembly, and remove it from the main fan body. Retain the screws for reattachment on the other side.
4) Remove the green ground wire from the left side of



Thermodisc Assembly

bolts

the fan motor, by detaching the phillips screw. Keep the screw to reattach the green ground wire on the other side.

5) Raising the fan deflector, pull the wire harness, switch plate, ground wire and thermodisc assembly from the left side and relocate to the right side of the main fan housing. See step 10 for Thermodisc Assembly installation.

Important Note:
The wire harness may be tight between the fan motor and main body but will move over and down to the base with a little f exing of the fan motor. Ensure the wire harness rests on the base when pulled over.

6) Remove the 2x 7/16" bolts from the right casting. Discard the existing casting plate and attach the new casting plate with the switch plate assembly.

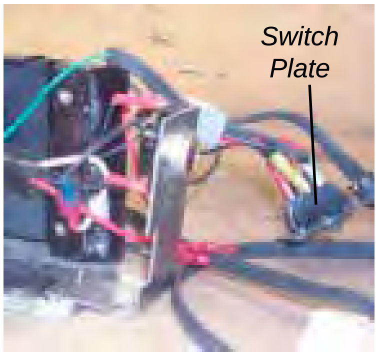
7) Remove the top black screw from the leg on the right side of the fan motor, and attach the screw to the leg on the left side.

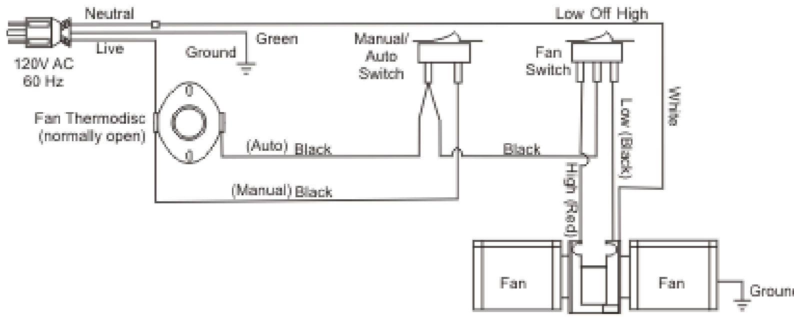
Existing Casting Plate

Right Side Leg

8) Attach the green ground wire with the #8 x 3/8" Pan Head Phillips steel self tapping screw, previously removed from the left side.

9) Remove the wires ***__one at a time__*** from the existing switch plate, and attach each wire to the new switch plate, each wire in the same position as it was on the old switch plate (see wiring diagram). Discard the old switch plate.





10) Attach the thermodisc assembly to the mounting holes located on the right side of the base of the main fan body using the existing hardware - 2 bolts, nuts and washers.

Important Note:
On older fan units these holes may require drilling. Use template provided to drill holes. Place template by aligning to the right corner of the thermodisc assembly base. See Diagram 1.

Thermodisc Assembly

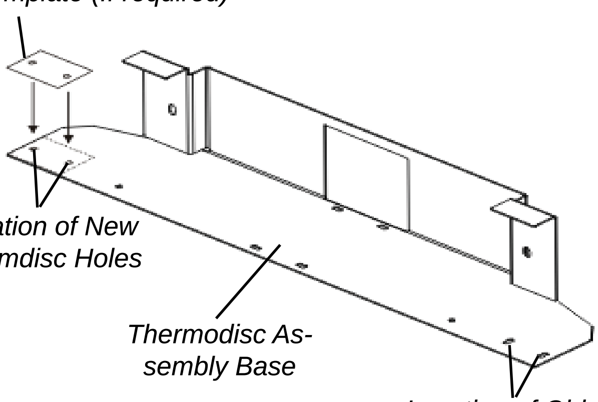
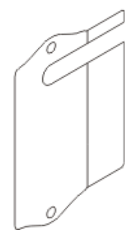


Diagram 1

11) Attach the new cover plate to the left side casting using 2x #6 32x3/8" Pan Head Phillips black screws.

Left Cover Plate

12) Attach the fan deflector to the main fan body by replacing the Phillips screw on the top of the fan housing.

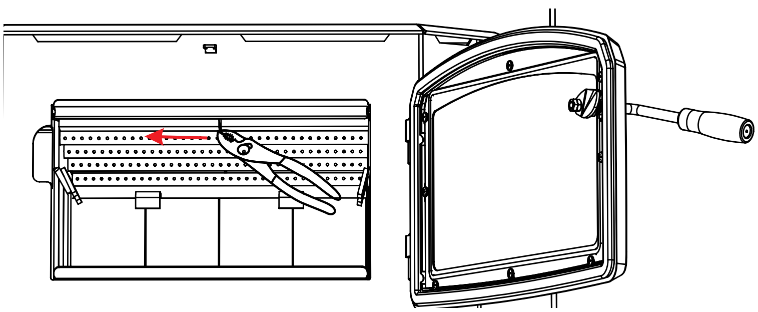
Flue Collar Removal and Installation

List of Tools required:
- Pull rod (supplied with unit)
- 1/2" socket / ratchet
- 3/8" open face wrench
- 7/16" socket / ratchet

NOTE: The removable flue collar is attached to the unit. If you need to remove the collar for ease of installation, please follow the below steps.

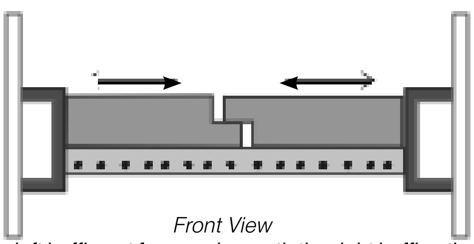
Note: unit in images may not be identical to the HI2450—but they depict the process.
SAFETY NOTE: The insert is very heavy and will require two people to move it into position. The door and bricks can be removed to help. Be sure to protect your hearth extension with a heavy blanket or cardboard during the installation.

1. Allow the stove to burn out and cool down.
2. Remove stainless steel smoke deflector - See instructions in this manual.
3. Remove the front 2 secondary air tubes with pliers as shown below.



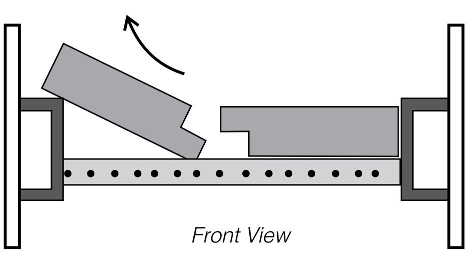
Note: F2500 shown

4. Remove baffles - push the baffles together and away from the side walls.



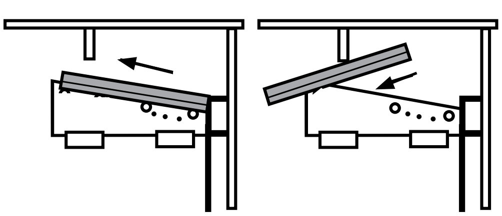
Front View

5. Lift the left baffle out from underneath the right baffle - then lift out. Remove the right baffle.



Front View

6. Manoeuver the baffle above the air tube and slide out.



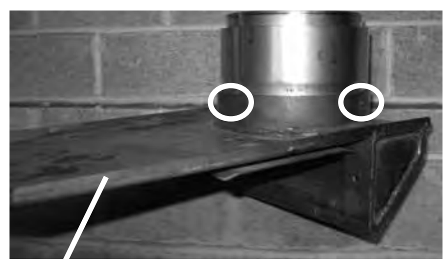
Side View

7. Take a ½" ratchet and remove the two bolts at back inside of the firebox. These bolts are used to secure the flue collar. Keep these and washers for re-install.

8. Slide collar off the unit.
9. Install flex liner into existing chimney as per liner manufacturer's specifications. See Diagram 1.

Diagram 1 *Flex Liner*

10. Secure the adaptor to the flex liner with three screws. Ensure the adapter is level and aligned correctly. See Diagram 2.



Flue Adaptor *Diagram 2*

11. Install the unit by first setting the rear of the unit into the fireplace. See Diagram 3. Ensure that the unit is centered in the existing fireplace and lined up with the flue adaptor.

Diagram 3

12. Slide the unit back until the flue adaptor is slightly engaged. At this point it is recommended to level the unit. This will keep the adaptor from binding.

13. Insert the provided pull rod through the hole in the top center of the unit. Secure the threaded end into the flue adaptor as shown in diagram 4. While sliding the unit into place pull on the rod to ensure that the flue adaptor is properly engaged. See Diagram 5. Double check the adaptor is seated properly and the pull rod in the firebox, locate the two holes lined up to the two holes on the adaptor.

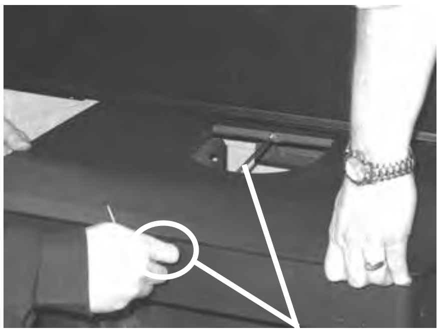


Diagram 4 *Pull Rod*

Pull Rod in place

Diagram 5

14. Use the two bolts, washers and lock washers (supplied in manual pack) and install them, tighten down using the 1/2" socket to ensure the adapter is positively secured to the unit. Once completed remove pull rod and place away for future re-install.

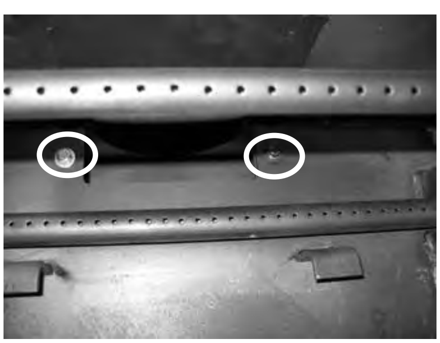


Diagram 6

15. Reverse steps 6-3 to complete the installation.

Floor Protection

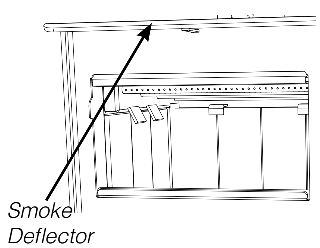
Please check to ensure that your floor protection and hearth will meet the standards for clearance to combustibles. Your hearth extension must be made from a non-combustible material.

Flue Baffle & Secondary Air Tube Installation

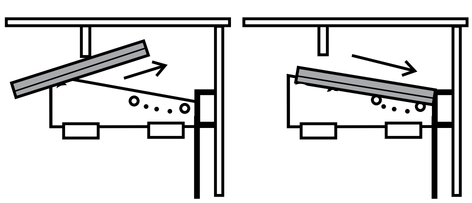
The flue baffle system located in the upper area of the firebox is removable to make cleaning your chimney system easier. The baffles must be installed prior to your first fire. **Smoke spillage and draft problems may occur if the baffles are improperly positioned.** Check the position of the baffles on a regular basis as they can be dislodged if too much fuel is forced into the firebox.

The unit arrives with the 2 baffles and 2 air tubes on the floor of the firebox.

1. Open the door and remove stainless steel smoke deflector - See smoke deflector instructions in this manual.

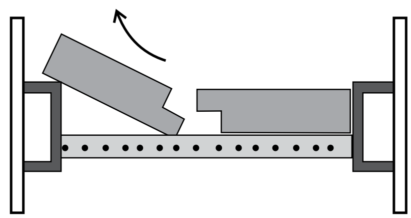


2. Slide the left baffle over the 2 remaining air tubes from the front and then push it to the back.



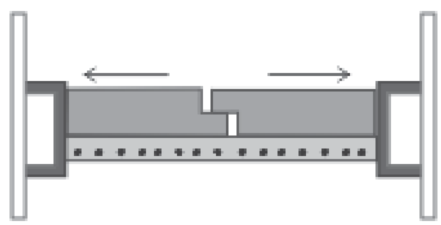
Side View

3. Tilt the left baffle up on top of the side channel and it will leave enough room to position the right baffle in the same manner as Step 1) above. Then reposition the left baffle flat on the air tubes.



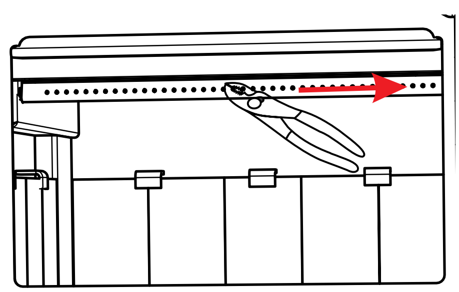
Front View

Important: push both baffles so they are tight against the side walls.



Front View

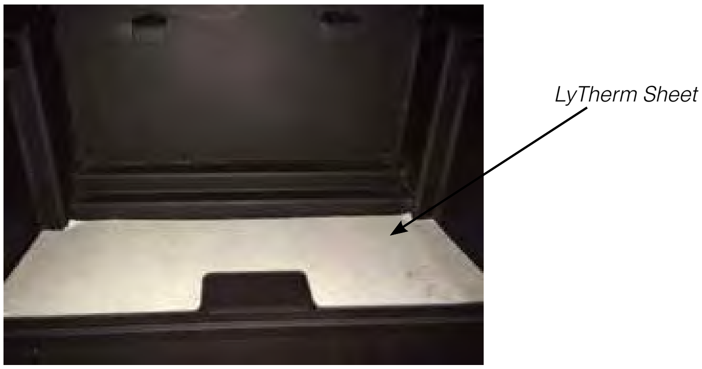
4 . Install the 2 front secondary air tubes with pliers and hammer to lock them into place, as shown below.



5. Reverse Step 1.

Brick Installation

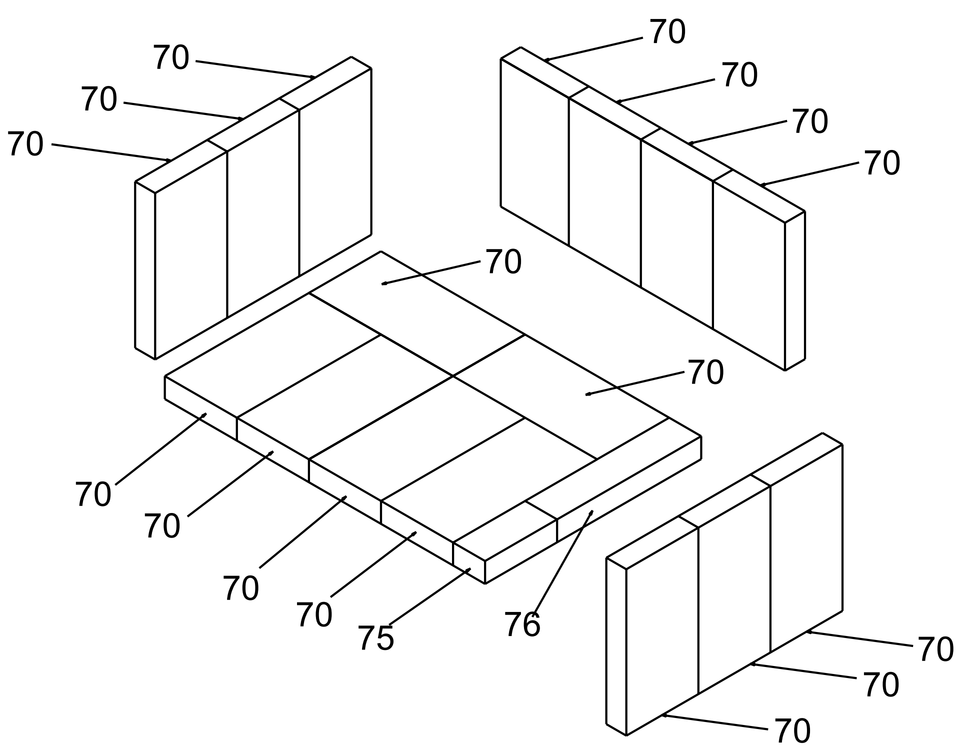
Firebrick is included to extend the life of your stove and radiate heat more evenly. Check to see that all firebricks are in their correct positions and have not become misaligned during shipping. Install all firebricks (if bricks were removed at install) per the diagram below and place in their correct positions.
Do not use a grate.



Order of firebrick install:

a) Rear Firebrick
b) Firebox floor - install brick over LyTherm Sheet
c) Right and left side Firebricks

	180-960	Firebrick - Complete Set
70)	902-111	Brick Regular Full Size: 1-1/4" x 4-1/2" x 9"
75)	*	Brick Partial: 1-1/4 x 4-1/2" x 2"
76)	*	Brick Partial: 1-1/4" x 2" x 9"



Seasoned Wood

Whether you burn wood in a fireplace, stove or insert, good quality firewood is the key to convenience, efficiency and safety. Wet wood and pieces that are not the right size and shape for your wood burner can be frustrating, burn inefficiently and deposit creosote that can fuel a dangerous chimney fire. Good planning, seasoning and storage of the firewood supply are essential to successful wood burning.

- Stack the wood in separate rows in an open location where the summer sun can warm it and breezes can carry away the moisture. Do not stack unseasoned wood tightly in an unvented storage area.
- Do not allow firewood to lie on the ground for more than a couple of days before stacking. Mould and rot can set in quickly.
- Stack the wood up off the ground on poles, lumber rails or pallets.
- The top of the pile can be covered to keep off rain, but do not cover the sides.

Softer woods like pine, spruce and poplar/aspen that is cut, split and stacked properly in the early spring maybe be ready for burning in the fall. Extremely hard woods like oak and maple, and large pieces of firewood, may take a minimum of a full year to dry enough. Drying may also take longer in damp climates

There are a few ways to tell if wood is dry enough to burn efficiently. Use as many indicators as possible to judge the dryness of the firewood your are considering. Here are ways to judge firewood moisture.

- Using a moisture meter, select the species of fuel and then penetrate the pins into a split piece. Ideal moisture and seasoned firewood should be less than 20% moisture content.
- Checks or cracks in the end grain can be an indication of dryness, but may not be a reliable indicator. Some wet wood has checks and some dry wood has no checks.
- The wood tends to darken from white or cream colour to grey or yellow as it dries.
- Two dry pieces banged together sound hollow; wet pieces sound solid and dull.
- Dry wood weighs much less than wet wood.
- Split a piece of wood. If the exposed surface feels damp, the wood is too wet to burn.

Operating Instructions

With your unit now correctly installed and safety inspected by your local authority, you are now ready to start a fire. Before establishing your first fire, it is important that you fully understand the operation of your draft control.

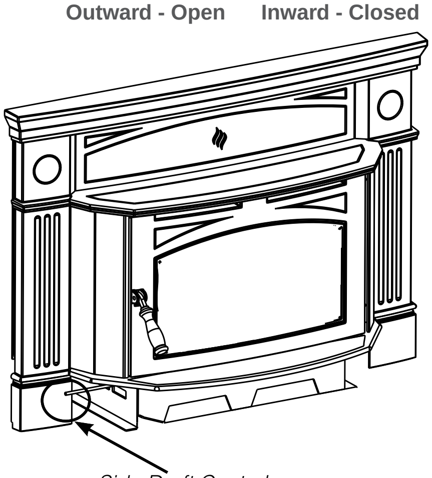
> **WARNING**
> **Fireplace Stoves equipped with doors should be operated only with doors fully closed. If doors are left partly open, gas and flame may be drawn out of the fireplace stove opening, creating risks from both fire and smoke.**

Draft Control

Both the primary and air wash drafts are controlled by the control slide located on the front left side of the unit. To increase your draft - slide to the left to open, and to decrease - slide to the right to close. The HI2450 unit has a secondary draft system that continually allows combustion air to the induction ports at the top of the firebox.

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 and may damage the unit. Inadequate draft may cause back puffing into the room and plugging of the chimney.

Outward - Open **Inward - Closed**



Side Draft Control

Left - Open **Right - Closed**

> **WARNING: To build a fire in ignorance or to disregard the information contained in this section can cause serious permanent damage to the unit and void your warranty!**

First Fire

When your installation is completed and inspected you are ready for your first fire.

THIS UNIT IS DESIGNED TO BURN SEASONED CORDWOOD ONLY. COAL, BRIQUETTES AND ALL OTHERS LISTED ON PAGE 2 ARE NOT APPROVED. SEASONED CORDWOOD SHOULD BE LESS THAN 20% MOISTURE CONTENT.

<u>START UP AND OPERATING PROCEDURES:</u>

1. For the first few days, the stove will give off an odour from the paint. This is to be expected as the high temperature paint becomes seasoned. Windows and/or doors should be left open to provide adequate ventilation while this temporary condition exists. Burning the stove at a very high temperature the first few times may damage the paint. Burn fires at a moderate level the first few days.
2. Do not place anything on the stove top during the curing process. This may result in damage to your paint finish.
3. During the first few days it may be more difficult to start the fire. As you dry out your firebrick and your masonry flue, your draft will increase.
4. Open the air control to fully open position (all the way to the left) and open the front fuel door. Load firebox with 1.7lb of kindling and crumpled paper and light crumpled paper to establish fire. DO NOT USE A GRATE TO ELEVATE THE FIRE.
   CAUTION: Never leave unit unattended if door is left open. This procedure is for fire start-up only, as unit may overheat if door is left open for too long.
5. Keep the door partially open for approximately 3 minutes and then close door.
   WARNING: Never build a roaring fire in a cold wood insert. Always warm your wood insert up slowly!
6. Once most of the kindling has burned down, add more kindling and a few bigger pieces of startup wood split approximately 2 inches thick. Keep the door open until flames are reestablished.
7. When a good fire is established, add 8-10 more pieces of startup wood and close the door right away.
8. Once a nice coal bed is established and there are still good sized flames, the main larger logs can be loaded into the firebox. Rake the coals to create a uniform charcoal bed. Load 5 pieces of 17" long cord wood front to back, North/South orientation.
9. Once strong flames are established close the door.
10. After 20 minutes the fan can be set on high setting.
11. After 30 minutes the damper can be adjusted to low or medium setting and the fan switched to the low setting.
12. For those units installed at higher elevations or into sub-standard masonry fireplaces, drafting problems may occur. Consult an experienced dealer or mason on methods of increasing your draft.
13. Some cracking and popping noises may be experienced during the heating up process. These noises will be minimal when your unit reaches temperature.
14. Before opening your door to reload, open the air control fully for approximately 10 to 15 seconds until the fire has been re-established. This will minimize any smoking (spilling) back into the room. After loading wood and front door closed, close the air control to your desired setting only once the fire has been reestablished.
15. All fuel burning appliances consume oxygen during operation. It is important that you supply a source of fresh air to your unit while burning. A slightly opened window is sufficient for the purpose. If you also have a fireplace in your home, a downdraft may be created by your Regency Stove causing a draft down your chimney. If this occurs, slightly open a window near your unit.

WARNING: If the body of your unit, or any part of the chimney connector starts to glow, you are over firing. Stop loading fuel immediately and close the draft control until the glow has completely subsided.

16. If you have been burning your stove on a low draft, use caution when opening the door. After opening the damper, open the door a crack, and allow the fire to adjust before fully opening the door.
17. The controls of your unit or the air supply passages should not be altered to increase firing for any reason.
18. If you burn the unit too slowly or at too low a setting your unit will not be operating as efficiently as it can. An easy rule of thumb says that if your glass is clean, then your flue is clean and your exhaust is clean. Burn the stove hot enough to keep your glass clean, you won't need to clean your flue as often.

How to Light & Maintain a Wood Stove Fire

Fan Operation

Automatic
To operate the fan - ensure switch is in AUTO mode.

This will allow the fan to turn on as the stove has come up to operating temperature. It will also shut the fan system off after the fire has gone out and the unit cooled to below a useful heat output range.

Operate the fan in the low speed position when burning in the LOW-MED LOW heat output ranges and operate in the high setting for MED-HIGH to HIGH heat outputs.

Route power cord to either left or right and plug into suitable 3 prong grounded plug.

Ash Disposal

During constant use, ashes should be removed every few days.

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 cinders have thoroughly cooled.

Safety Precautions

1. Do not allow ashes to build up to the loading doors! Only remove ashes when the fire has died down. Even then, expect to find a few hot embers.

2. Please take care to prevent the build-up of ash around the start-up air housing located inside the stove box, under the loading door lip.

Safety Guidelines and Warnings

CAUTION: Do not use chemicals as fluids to start fire.

1. **CAUTION:** Never use gasoline, gasoline type lantern fuels, kerosene, charcoal lighter fuel, or similar liquids to start or 'freshen up' a fire in your heater. Keep all such liquids well away from the heater while it is in use.

2. Keep the door closed during operation and maintain all seals in good condition.

3. Do not burn any quantities of paper, garbage, and never burn flammable fluids such as gasoline, naptha or engine oil in your stove.

4. If you have smoke detectors, prevent smoke spillage as this may set off a false alarm.

5. Do not overfire heater. If the chimney connector, flue baffle or the stove top begin to glow, you are over firing. Stop adding fuel and close the draft control. Over firing can cause extensive damage to your stove including warping and premature steel corrosion. Over firing will void your warranty.

6. Do not permit creosote or soot build-up in the chimney system. Check and clean chimney at regular intervals. Failure to do so can result in a serious chimney fire.

7. Your Regency stove can be very hot. You may be seriously burned if you touch the stove while it is operating, keep children, clothing and furniture away. Warn children of the burn hazard.

8. The stove consumes air while operating, provide adequate ventilation with an air duct or open a window while the stove is in use.

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

10. Do not use grates or andirons or other methods for supporting fuel. Burn directly on the bricks.

11. Open the draft control fully for 10 to 15 seconds prior to slowly opening the door when refuelling the fire.

12. Do not connect your unit to any air distribution duct.

13. This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods.

14. In the event of component failure, replace parts with only Regency listed parts.

15. Warning: do not abuse glass door such as striking or slamming shut.

16. Do not store any fuel closer than 2 feet from your unit. Do not place wood, paper, furniture, drapes or other combustibles near the appliance.

17. **CAUTION**: Do not operate with broken glazing.

CAUTION: HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS.

Maintenance

It is very important to carefully maintain your fireplace stove, including burning seasoned wood and maintaining a clean stove and chimney system. Have the chimney cleaned before the burning season and as necessary during the season, as creosote deposits may build up rapidly. Moving parts of your stove require no lubrication.

Creosote

When wood is burned slowly, it produces tar and other organic vapours combine with moisture to form creosote. The creosote vapours condense in the relatively cool chimney flue of a slow burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote can result in an extremely hot fire.

The chimney connector and chimney should be inspected at least once every two months during the heating season to determine if creosote build up has occurred. If creosote has accumulated it should be removed to reduce the risk of chimney fire.

CAUTION: Things to remember in case of a chimney fire:

1. Close all draft and damper controls.

2. CALL THE FIRE DEPARTMENT.

Ways to Prevent and Keep Unit Free of Creosote

1) Burn stove with the draft control wide open for about 10-15 minutes every morning during burning season.

2) Burn stove with draft control wide open for about 10 - 15 minutes every time you apply fresh wood. This allows the wood to achieve the charcoal stage faster and burns up any unburned gas vapours which might otherwise be deposited within the system.

3) **Only burn seasoned wood!** Avoid burning kiln dried, wet or green wood. Seasoned wood has been dried at least one year.

4) A small hot fire is preferable to a large smouldering one that can deposit creosote within the system.

5) The chimney and chimney connector should be inspected at least once every two months during the heating season to determine is a creosote buildup has occurred.

6) **Have chimney system and unit cleaned by competent chimney sweeps twice a year during the first year of use and at least once a year thereafter or when a significant layer of creosote has accumulated (3 mm/1/8" or more) it should be removed to reduce the risk of a chimney fire.**

Door Gasket

If the door gasket requires replacement, use a 7/8" gasket rope (Part #846-570). A proper high temperature gasket adhesive is required. See your Regency Dealer.
The door catch may require adjustment as the door gasket compresses after a few fires. The door latch compression may require adjustment to renew seal. Removal of a shim, (see section in this manual), will allow the latch to be moved closer to the door frame, causing a tighter seal.

Glass Maintenance

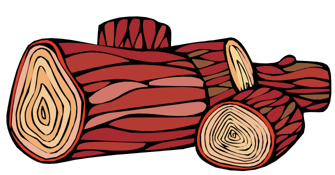
Your Regency stove is supplied with 5mm Neoceram ceramic glass (Part #940-370/P) that will withstand the highest heat that your unit will produce. In the event that you break your glass by impact, purchase your replacement from an authorized Regency dealer only, and follow our step-by-step instructions for replacement (refer to Glass Replacement section).

Allow the stove to cool down before cleaning the glass. Cleaning the glass will prevent build up of carbon and allow full view of the fire.

WARNING: Do not clean the glass when it is hot.
WARNING: Do not use abrasive cleaners, a damp cloth and glass cleaner is effective.

Wood Storage

Store wood under cover, such as in a shed, or covered with a tarp, plastic, tar paper, sheets of scrap plywood, etc., as uncovered wood can absorb water from rain or snow, delaying the seasoning process.



DO NOT BURN:

- Treated wood
- Coal
- Garbage
- Cardboard
- Solvents
- Colored Paper
- Trash
- Salt drift wood
- Cut lumber, plywood, mill ends.

Burning treated wood, garbage, solvents, colored paper or trash may result in release of toxic fumes. Burning coal, cardboard, or loose paper can produce soot, or large flakes of char or fly ash, causing smoke spillage into the room.

CAUTION: DO NOT BURN GARBAGE OR FLAMMABLE LIQUIDS SUCH AS GASOLINE, NAPTHA OR ENGINE OIL. SOME FUELS COULD GENERATE CARBON MONOXIDE AND ARE VERY DANGEROUS.

CAUTION: DO NOT CONNECT TO, OR USE IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCT WORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATION.

Cleaning & Maintaining Your Wood Stove

Door Gasket

If the door gasket requires replacement, 7/8" diameter material must be used. A proper high temperature gasket adhesive is required. A gasket repair kit, Part # 846-570 is available from your local Hampton dealer.

Glass Cleaning

Only clean your glass window when it is cool. Your local retailer can supply you with special glass cleaner if plain water and a soft cloth does not remove all deposits.

Door Removal

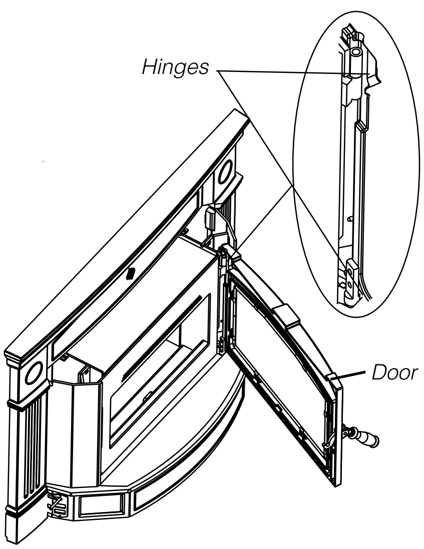
When handling enamel parts, please handle with care as they can be damaged.

1) Remove the Top Faceplate by lifting straight up from the sides.

2) Lift off Mantel Top.

3) Open the Door and lift up off its hinges.

Please be careful when removing the Door and not to drop onto the Ashlip, it may chip.



DOOR INSTALLATION NOTE
After re-installing the door, carefully swing open and check the clearance to the Right Hand Cast Side. If tight or rubbing, loosen the 7/16 nuts and adjust the clearance and then re-tighten.

Glass Replacement

1) Open door.

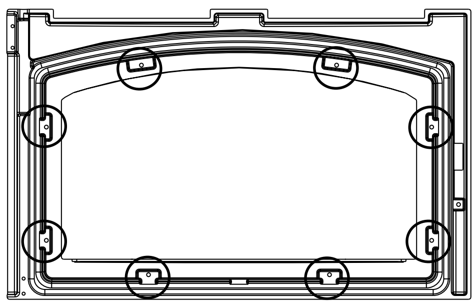
2) To replace the glass remove the 8 screws highlighted in the diagram below.

3) Lift off the 4 glass retainers and carefully remove glass.

4) Place new glass in the door, make sure that the glass gasketing will properly seal your unit.

5) Position the glass retainer back on. Ensure that it rests on the gasket and not the glass.

6) Secure glass retainer using the 8 screws. Do not wrench down on the glass as this may cause the glass to break.



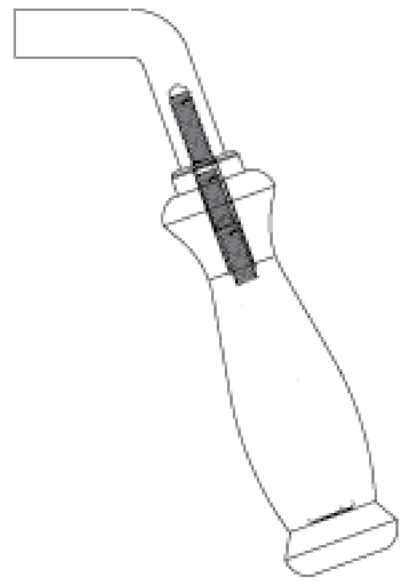
Remove 8 screws

Avoid impact on glass doors such as striking or slamming shut.

Handle Replacement

1) Remove handle by unscrewing it from the latch.

2) Fit new door handle over latch and screw it in to place.



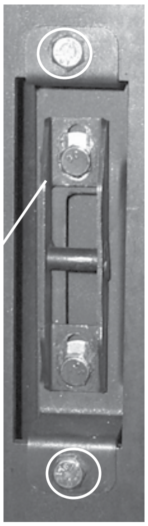
Cleaning & Maintaining Your Wood Stove

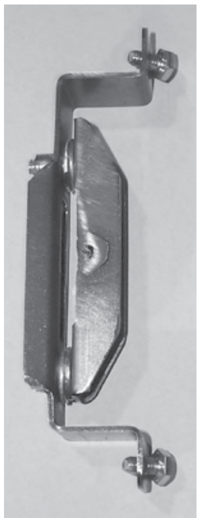
Latch Adjustment

The door latch may require adjustment as the door gasket material compresses after a few fires. Removal of spacers will allow the latch to be moved closer to the door frame, causing a tighter seal.

1) Remove the Latch Assembly from the unit by undoing the outer 2 bolts.

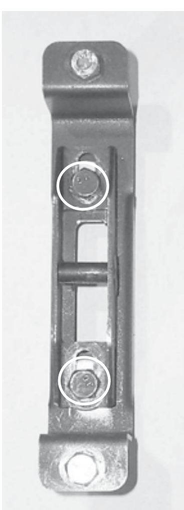
Latch Assembly

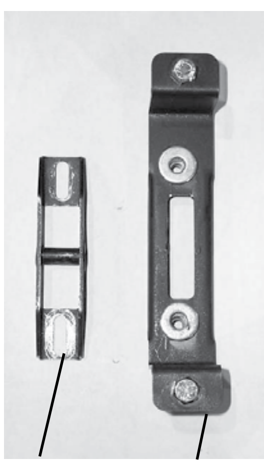




Latch Assembly removed from unit.

2) Remove the Latch from the Mounting Bracket by undoing the inner 2 bolts.





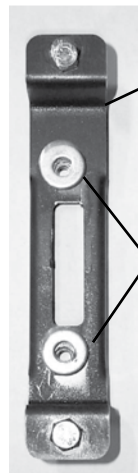
Latch

Mounting Bracket

Cleaning & Maintaining Your Wood Stove

3) Remove necessary amount of spacers sitting on the Mounting Bracket.

Ensure an equal amount of spacers are removed from both top and bottom.



Mounting Bracket

Spacers

4) Re-secure Latch to Mounting Bracket using 2 bolts.

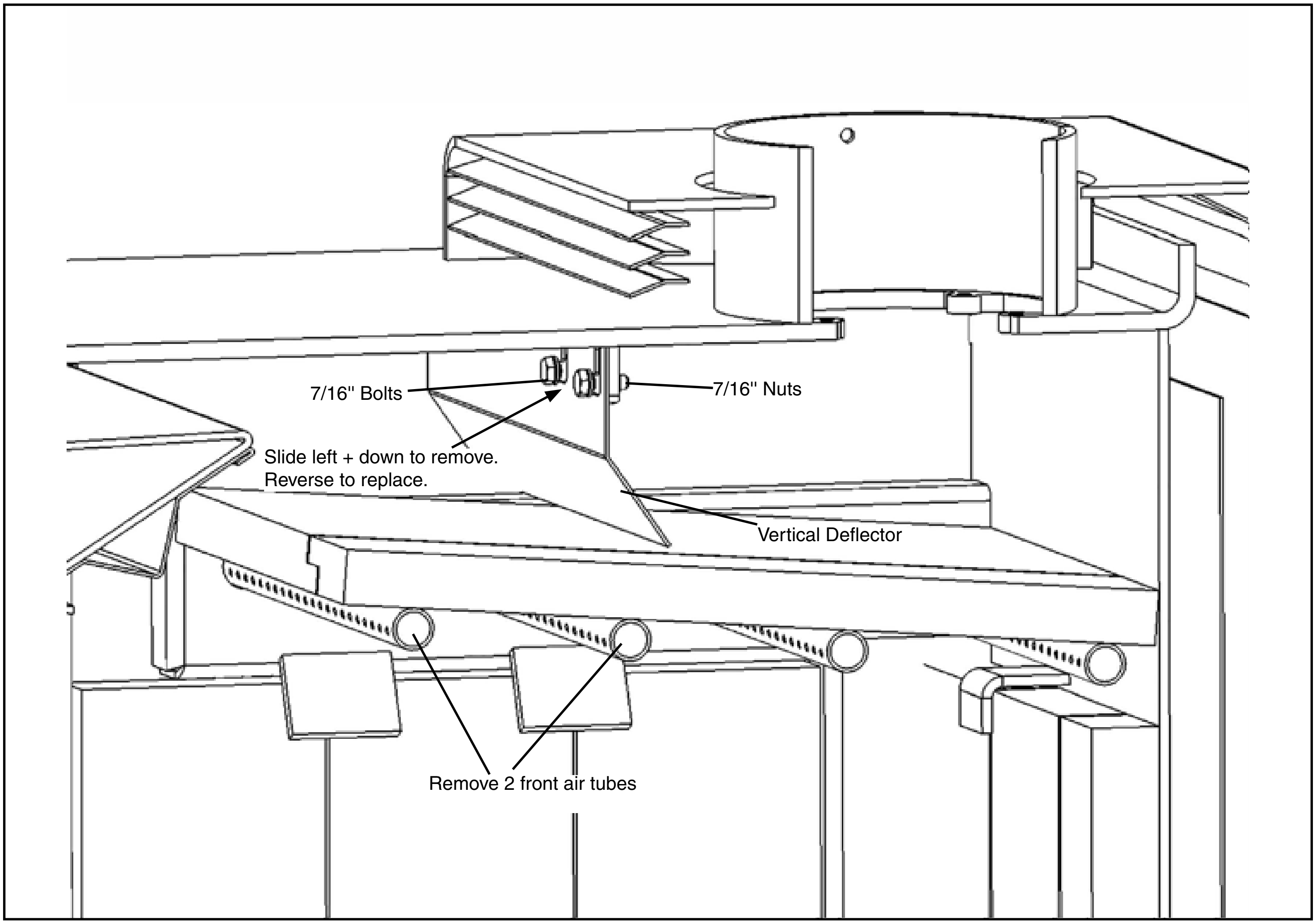
Latch Assembly re-assembled with spacers removed.

5) Re-secure the Latch Assembly to the unit using 2 bolts.

Annual Maintenance	
Completely clean out entire unit	Annually
Inspect air tube and bricks	Replace any damaged parts.
Adjust door catch assembly	If unable to obtain a tight seal on the door - replace door gasket seal. Readjust door catch after new gasket installed.
Inspect condition and seal of: Glass Gasket Door Gasket	Perform paper test - replace gasket if required
Paper Test	Test the seal on the loading door with a paper bill. Place a paper bill in the gasket area of the door on a cold stove. Close the door. Try to remove the paper by pulling. The paper should not pull out easily, if it does, try adjusting the door latch, if that doesn't solve the problem replace the door gasket.
Check and lubricate door hinge + latch	Use only high temperature anti seize lube. (ie. never seize)
Check glass for cracks	Replace if required.
Clean blower motor	Disconnect power supply. Remove and clean blower. ***DO NOT LUBRICATE***
Inspect and clean chimney	Annual professional chimney cleaning recommended.

NOTE:
Chimney Cleaning
When cleaning the chimney system the air tubes, baffles should be removed for ease of cleaning. See manual for details on removal. We highly recommend that the chimney cleaning be done by a professional as they will have the necessary tools such as a proper sized brush and special vacuum cleaner designed to deal with fine particles.

Vertical Stainless Deflector Replacement



1. Remove 2 front secondary air tubes / vermiculite baffles as per page 24.
2. Loosen the two 7/16" bolts + nuts to remove / replace vertical baffle.
3. Repeat steps to install new vertical deflector.

NOTE: ENSURE BAFFLE IS PUSHED UP AS FAR AS POSSIBLE. TIGHT TO TOP OF FIREBOX.

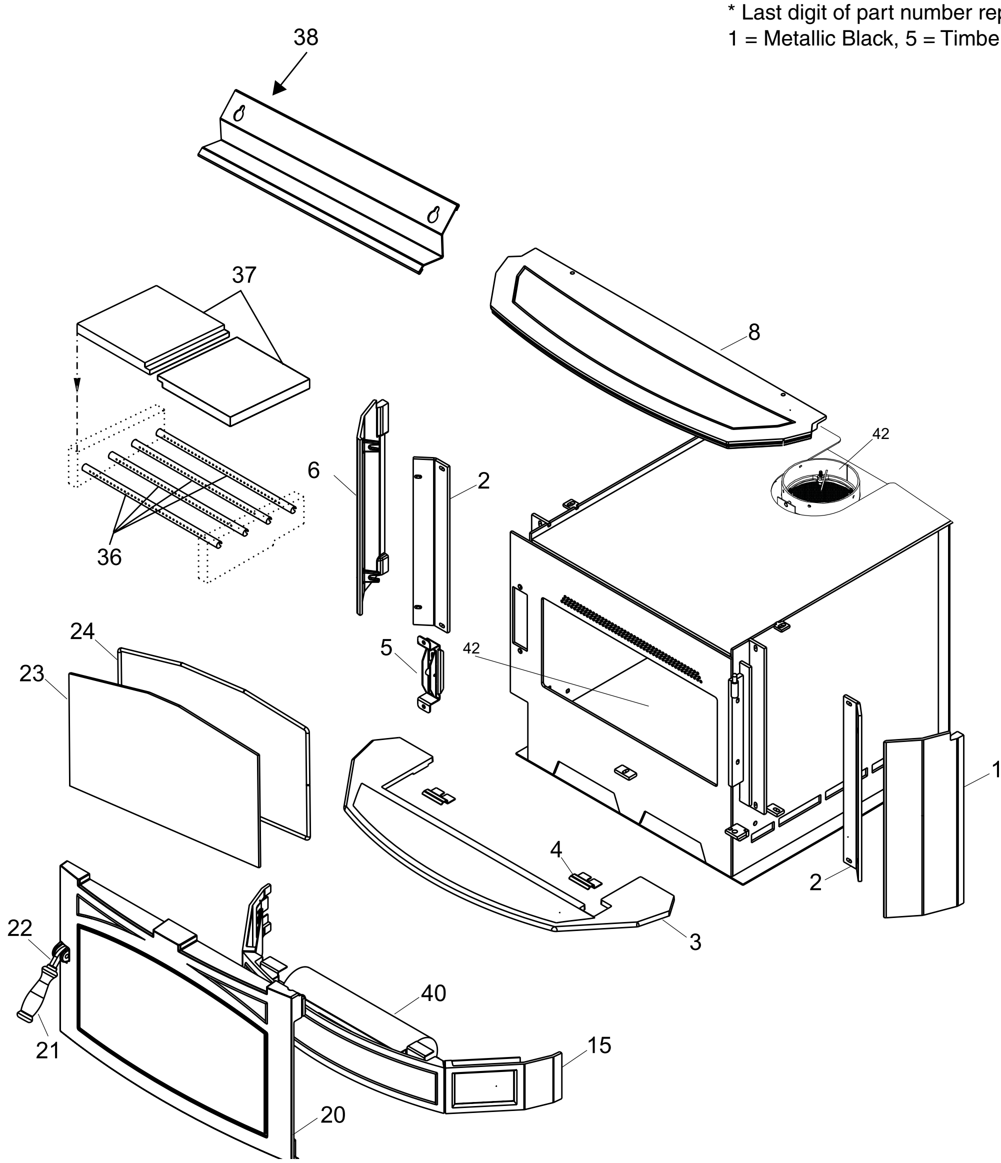
Main Assembly

	Part #	Description
1)	942-681*	Right Side Cast
	936-238	Side Cast Gasket
2)	300-021	Flange Adaptor
3)	942-691*	Ashlip
4)	300-006	Fan Clip
6)	942-671*	Left Side Cast
	936-238	Side Cast Gasket
8)	942-661*	Mantel Top
15)	300-911*	Fan Assembly
20)	300-571*	Door Assembly
21)	948-179	Wooden Handle Black
22)	300-551	Door Latch
23)	940-370/P	Door Glass
	846-570	Door Gasket Kit
24)		Glass Retainer
	936-238	Glass Gasket (sold per ft.)
36)	033-953	Air Tube 3/4" (Qty:4)
37)	020-957	Baffle (2/set)
38)	181-019	Smoke Deflector
40)	910-157/P	Fan Motor Only
41)	021-022	Firebox Floor Gasket
42)	181-632/P	Flue Adaptor

Not Shown in the drawing:

300-981*	Cast Grill
181-039	Wood Damper Handle
910-142	Fan Thermodisc
910-138	2 Way Switch
910-140	3 Way Switch
948-220	Hampton Logo Plate
910-678	120 Volt Power Cord
300-513	Upper Door Hinge Assembly
948-155	Bottom Door Hinge Pin
181-045/P	Vertical Stainless Deflector

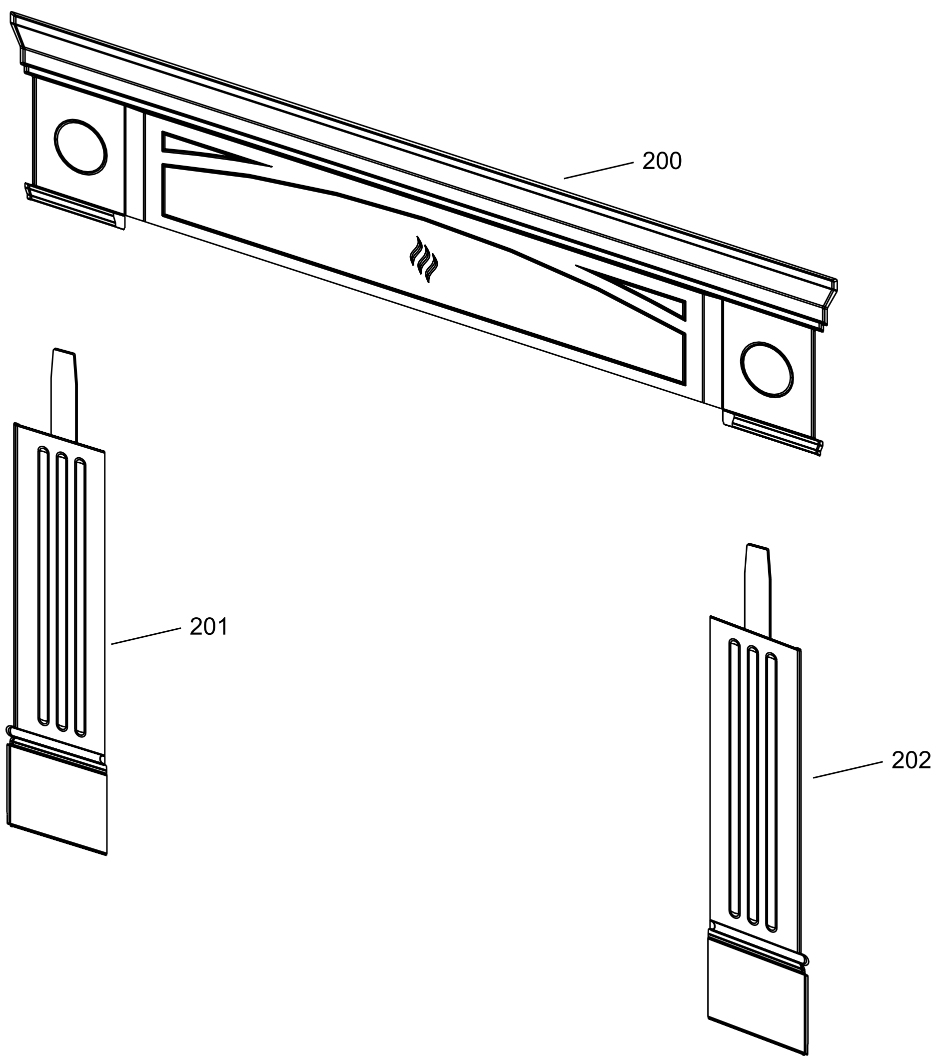
* Last digit of part number represents color:
1 = Metallic Black, 5 = Timberline Brown,



Standard Cast Faceplate

	Part #	Description
	300-921	Cast Faceplate - Metallic Black
	300-925	Cast Faceplate - Timberline Brown
200) *		Top Faceplate
201) *		Left Side Faceplate
202) *		Right Side Faceplate

* Not available as a replacement part.



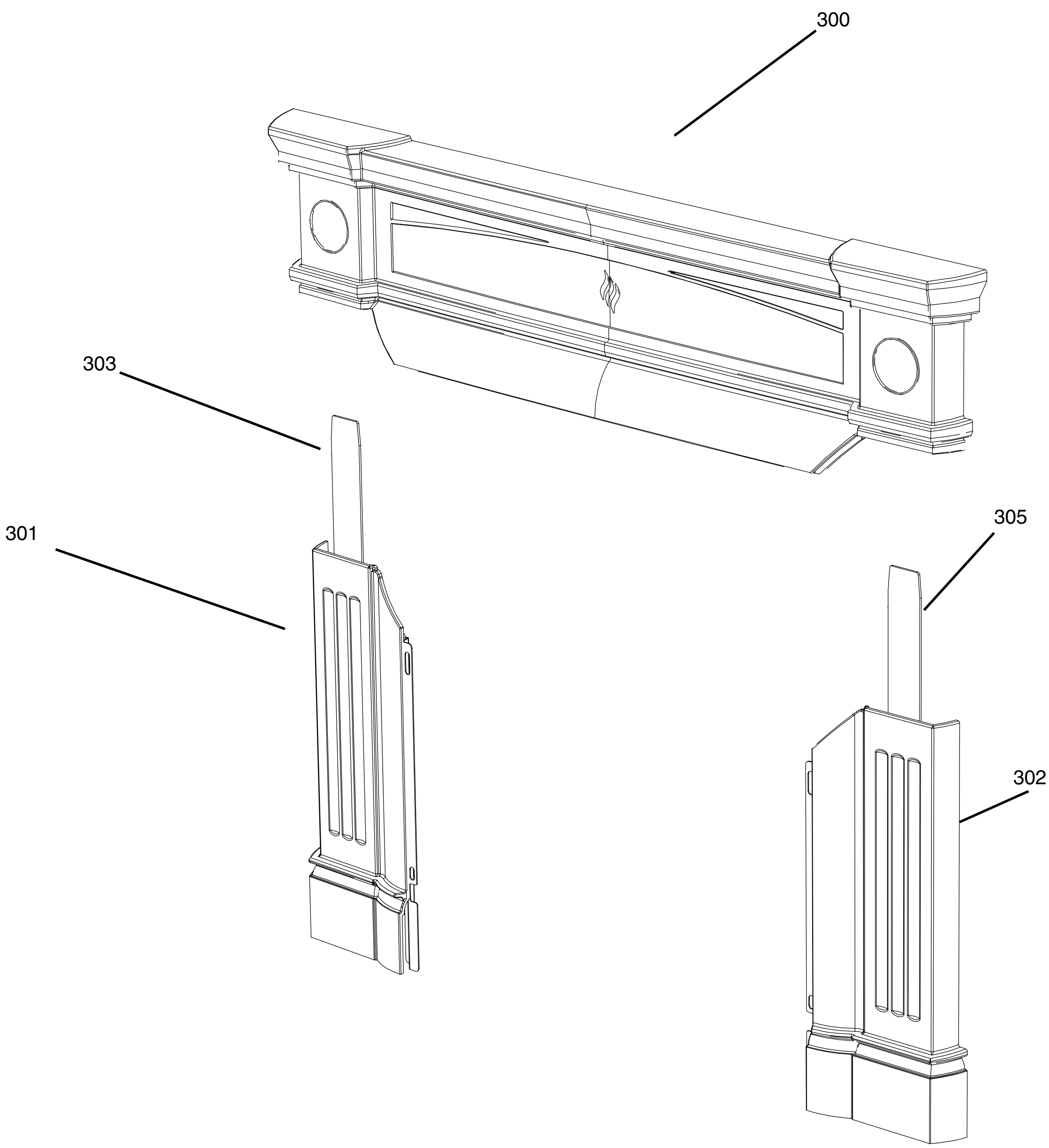
Oversize Cast Faceplate

Part #	Description
300-971	Oversize Cast Faceplate - Metallic Black
300-975	Cast Faceplate - Timberline Brown
300) *	Top Faceplate
301) *	Left Side Faceplate
302) *	Right Side Faceplate
303) 300-060	Mounting Plate LH
305) 300-061	Mounting Plate RH

Not Shown in the Drawing

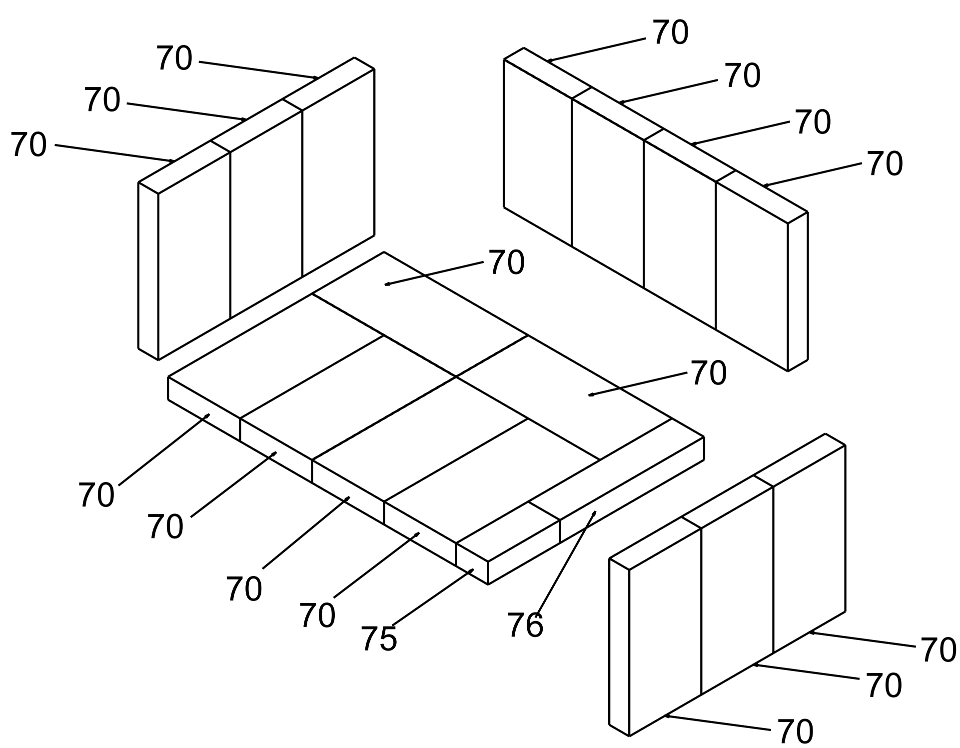
300-005 Top Retainer

* Not available as a replacement part.



Brick Panels - HI2450

	Part #	Description
	180-960	Firebrick - Complete Set
70)	902-111	Brick Regular Full Size: 1-1/4" x 4-1/2" x 9"
75)	*	Brick Partial: 1-1/4 x 4-1/2" x 2"
76)	*	Brick Partial: 1-1/4" x 2" x 9"



Limited Lifetime Warranty

FPI Fireplace Products International Ltd. (for Canadian customers) and Fireplace Products U.S., Inc. (for U.S. customers) (collectively referred to herein as “FPI”) extends this Limited Lifetime Warranty to the original purchaser of this appliance provided the product remains in the original place of installation. The items covered by this limited warranty and the period of such coverage is set forth in the table below.

Some conditions apply (see below).

The policy is not transferable, amendable, or negotiable under any circumstances.

Wood Products	Component Coverage					Labor Coverage
Components Covered	Limited Lifetime	5 years	2 years	1 year	Warranty	(Years)
Welded Firebox Steel	✓					5
All Stainless Steel Components, Smoke Deflectors, Heat Shields etc.	✓					3
Air Tubes	✓					3
Airmate	✓					3
Door handle and latch assembly, all hardware	✓					3
Glass Thermal Breakage Only	✓					3
Steel Faceplates, Accessory Housings	✓					3
All Plating	✓					3
Ash Drawer, Heatshields, Pedestal	✓					
All Baffles, Steel, Ceramic, Vermiculite C-Baffles	✓					
All castings, firebox, surrounds, doors, panels etc.		✓				3
All Electrical, Blower, wiring, switches etc.			✓			2
Glass - Crazing				✓		1
Catalyst Combustor					*10 Years Prorated	
Venting/Chimney				✓		1
Screens				✓		1

*See specific warranty details in regards to the catalyst combustor in unit manual.

Conditions:

Warranty protects against defect in manufacture or FPI factory assembled components only, unless herein specified otherwise.

Any part(s) found to be defective during the warranty period as outlined above will be repaired or replaced at FPI’s option through an accredited distributor, dealer or pre-approved and assigned agent provided that the defective part is returned to the distributor, dealer or agent for inspection if requested by FPI. Alternatively, FPI may at its own discretion fully discharge all of its obligations under the warranty by refunding the verified purchase price of the product to the original purchaser. The purchase price must be confirmed by the original Bill of Sale.

The authorized selling dealer, or an alternative authorized FPI dealer if pre-approved by FPI, is responsible for all in-field diagnosis and service work related to all warranty claims. FPI is not responsible for results or costs of workmanship of unauthorized FPI dealers or agents in the negligence of their service work.
At all times FPI reserves the right to inspect reported complaints on location in the field claimed to be defective prior to processing or authorizing of any claim. Failure to allow this upon request will void the warranty.

All warranty claims must be submitted by the dealer servicing the claim, including a copy of the Bill of Sale (proof of purchase by you). All claims must be complete and provide full details as requested by FPI to receive consideration for evaluation. Incomplete claims may be rejected.

Replacement units are limited to one per warranty term. Airtube and baffle replacements are limited to one replacement per term.

Unit must be installed according to all manufacturers' instructions as per the manual.

All Local and National required codes must be met.

The installer is responsible to ensure the unit is operating as designed at the time of installation.

The original purchaser is responsible for annual maintenance of the unit, as outlined in the owner's manual. As outlined below, the warranty may be voided due to problems caused by lack of maintenance.

Repair/replacement parts purchased by the consumer from FPI after the original coverage has expired on the unit will carry a 90 day warranty, valid with a receipt only. Any item shown to be defective will be repaired or replaced at our discretion. No labor coverage is included with these parts.

Exclusions:
This Limited Lifetime Warranty does not extend to rust or corrosion of any kind due to: a lack of maintenance or improper venting, lack of combustion air provision, or exposure to corrosive chemicals (i.e. chlorine, salt, air, etc.).

This Limited Lifetime Warranty also does not extend to: paint, firebricks (rear, sides, or bottom), door gasketing, glass gasketing (or any other additional factory fitted gasketing), vermiculite floor bricks, andiron assemblies, and flue damper rods.

Malfunction, damage or performance based issues as a result of environmental conditions, location, chemical damages, downdrafts, installation error, installation by an unqualified installer, incorrect chimney components (including but not limited to cap size or type), operator error, abuse, misuse, use of improper fuels (such as unseasoned cordwood, mill-ends, construction lumber or debris, off-cuts, treated or painted lumber, metal or foil, plastics, garbage, solvents, cardboard, coal or coal products, oil based products, waxed cartons, compressed pre-manufactured logs, kiln dried wood), lack of regular maintenance and upkeep, acts of God, weather related problems from hurricanes, tornados, earthquakes, floods, lightning strikes/bolts or acts of terrorism or war, which result in malfunction of the appliance are not covered under the terms of this Limited Lifetime Warranty.

FPI has no obligation to enhance or modify any unit once manufactured (i.e. as products evolve, field modifications or upgrades will not be performed on existing appliances).

This warranty does not cover dealer travel costs for diagnostic or service work. All labor rates paid to authorized dealers are subsidized, pre-determined rates. Dealers may charge homeowner for travel and additional time beyond their subsidy.

Any unit showing signs of neglect or misuse will not be covered under the terms of this warranty policy and may void this warranty. This includes units with rusted or corroded fireboxes which have not been reported as rusted or corroded within three (3) months of installation/purchase.

Units which show evidence of being operated while damaged, or with problems known to the purchaser and causing further damages will void this warranty.

Units where the serial no. has been altered, deleted, removed or made illegible will void this warranty.

Minor movement, expansion and contraction of the steel is normal and is not covered under the terms of this warranty.

FPI is not liable for the removal or replacement of facings or finishing in order to repair or replace any appliance in the field.

Freight damages for products or parts are not covered under the terms of the warranty.

Products made or provided by other manufacturers and used in conjunction with the FPI appliance without prior authorization from FPI may void this warranty.

Limitations of Liability:
The original purchaser's exclusive remedy under this warranty, and FPI's sole obligation under this warranty, express or implied, in contract or in tort, shall be limited to replacement, repair, or refund, as outlined above. IN NO EVENT WILL FPI BE LIABLE UNDER THIS WARRANTY FOR ANY INCIDENTAL OR CONSEQUENTIAL COMMERCIAL DAMAGES OR DAMAGES TO PROPERTY. TO THE EXTENT PERMITTED BY APPLICABLE LAW, FPI MAKES NO EXPRESS WARRANTIES OTHER THAN THE WARRANTY SPECIFIED HEREIN. THE DURATION OF ANY IMPLIED WARRANTY IS LIMITED TO DURATION OF THE EXPRESSED WARRANTY SPECIFIED ABOVE. IF IMPLIED WARRANTIES CANNOT BE DISCLAIMED, THEN SUCH WARRANTIES ARE LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

Some U.S. states do not allow limitations on how long an implied warranty lasts, or allow exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

Customers located outside the U.S. should consult their local, provincial or national legal codes for additional terms which may be applicable to this warranty.

How to Obtain Warranty Service:
Customers should contact the authorized selling dealer to obtain all warranty and service. In the event the authorized selling dealer is unable to provide warranty / service, please contact FPI by mail at the address listed on the next page. Please include a brief description of the problem and your address, email and telephone contact information. A representative will contact you to make arrangements for an inspection and/or warranty service, by an alternative dealer.

Product Registration and Customer Support:
Thank you for choosing a Regency Fireplace. Regency strives to be a world leader in the design, manufacture, and marketing of hearth products. To provide the best support for your product, we request that you complete a product registration form at http://www.regency-fire.com/Customer-Care/Warranty-Registration.aspx within ninety (90) days of purchase.

Product Registration and Customer Support:

Thank you for choosing a Regency Fireplace. Regency strives to be a world leader in the design, manufacture, and marketing of hearth products. To provide the best support for your product, we request that you complete a product registration form found on our Web Site under Customer Care within ninety (90) days of purchase.

For purchases made in **CANADA or the UNITED STATES**:
http://www.regency-fire.com/Customer-Care/Warranty-Registration.aspx

For purchases made in AUSTRALIA:
http://www.regency-fire.com.au/Customer-Care/Warranty-Registration.aspx

You may also complete the warranty registration form below to register your Regency Fireplace Product and mail and/or fax it back to us, and we will register the warranty for you. It is important you provide us with all the information below in order for us to serve you better.

Warranty Registration Form (or Register online immediately at the above Web Site):

Warranty Details	
Serial Number (required):	
Purchase Date (required) (mm/dd/yyyy):	
Product Details	
Product Model (required):	
Dealer Details	
Dealer Name (required):	
Dealer Address:	
Dealer Phone #:	
Installer:	
Date Installed (mm/dd/yyyy):	
Your Contact Details (required)	
Name:	
Address:	
Phone:	
Email:	

For purchases made in CANADA:

FPI Fireplace Products International Ltd.
6988 Venture St.
Delta, British Columbia
Canada, V4G 1H4

Phone: 604-946-5155
Fax: 1-866-393-2806

For purchases made in the UNITED STATES:

Fireplace Products US, Inc.
PO Box 2189 PMB 125
Blaine, WA
United States, 98231

Phone: 604-946-5155
Fax: 1-866-393-2806

For purchases made in AUSTRALIA:

Fireplace Products Australia Pty Ltd
1- 3 Conquest Way
Hallam, VIC
Australia, 3803

Phone: +61 3 9799 7277
Fax: +61 3 9799 7822

For fireplace care and tips and answers to most common questions please visit our Customer Care section on our Web Site. Please feel free to contact your selling dealer if you have any questions about your Regency product.

Installer: Please complete the following information

Dealer Name & Address:____

____

Installer: ____

Phone #: ____

Date Installed: ____

Serial #:____

Printed in Canada

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ACCREDITED
CERTIFICATE #1550.01

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

Report Number: DIRI01A05026181218

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

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

FUNCTIONAL CHECKS

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

CALIBRATION DATA

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

CALIBRATION STANDARDS

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

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

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

Report prepared/reviewed by: ServiceTechDC **Date:** 12/28/18 **Technician:** R.Kauble
Signature:

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

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A2LA ACCREDITED
CERTIFICATE #1550.01

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

Report Number: DIRI0182484A0912013i181218

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digiweigh	DWP12i 400x.01	82484A0912013i	#050	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.01	QC033	12/18/18	6/13/18	12/2019

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 50 Tol: 0.05	Test Wt: HB44 Tol: HB44	Test Wt: 50 Tol: 0.01	☐ Good ☑ Fair ☐ Poor
As-Found: Pass: ☑ Fail: ☐	As-Found: Pass: ☑ Fail: ☐	As-Found: Pass: ☑ Fail: ☐	
As-Left: Pass: ☑ Fail: ☐	As-Left: Pass: ☑ Fail: ☐	As-Left: Pass: ☑ Fail: ☐	Temperature: 16.4°C

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	399.99	399.99	0.058
300	300.00	300.00	0.058
200	200.03	200.03	0.058
100	100.01	100.01	0.012
50	50.00	50.00	0.012
20	20.00	20.00	0.012

CALIBRATION STANDARDS

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

Permanent Information Concerning this Equipment:

12 month calibration cycle.

Comments/Information Concerning this Calibration

12/18 - RH = 64%. Adjusted span.

Report prepared/reviewed by: ServiceTech JC **Date:** 12/28/18

Technician: R.Kauble
Signature:

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

y Gas Meter Calibrati

Meter Manufacturer:	Apex
Model:	XC-60-ED
Lab ID #:	53
Serial #:	1902130
Calibration Date:	12/17/2018
Calibration Expiration:	6/17/2019
Barometric Pressure:	29.87 in. Hg

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

Unit Under Test Previous Calibration	
Date	12/13/2018
γ Factor:	1.002
Allowable Deviation (±5%):	0.0501
Actual Deviation:	0.00
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	166.180	147.027	169.354
Standard DGM Temperature (°F)	71.7	72.5	73.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.950	5.296	6.132
DGM Temperature (°F)	83.0	91.0	93.0
DGM Pressure (in H_2O)	2.60	2.00	1.5
Time (min)	37.0	37.0	49.0
Net Volume for Standard DGM (ft^3)	5.869	5.192	5.981
Net Volume for DGM (ft^3)	5.950	5.296	6.132

Dry Gas Meter γ Factor	0.999	1.007	1.006
γ Factor Deviation From Average	0.999	1.007	1.006

Average Gas Meter γ Factor **1.004**

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

Technician: 12/17/2018

Dry Gas Meter Calibration

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

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

Unit Under Test Previous Calibration	
Date	12/13/2018
γ Factor:	0.997
Allowable Deviation (±5%):	0.04985
Actual Deviation:	0.00
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	153.596	138.287	193.022
Standard DGM Temperature (°F)	73.0	73.0	74.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.594	5.047	7.058
DGM Temperature (°F)	94.5	95.0	96.0
DGM Pressure (in H_2O)	2.60	2.00	1.5
Time (min)	35.0	36.0	57.0
Net Volume for Standard DGM (ft^3)	5.424	4.884	6.816
Net Volume for DGM (ft^3)	5.594	5.047	7.058

Dry Gas Meter γ Factor	1.000	1.001	1.000
γ Factor Deviation From Average	1.000	1.001	1.000

Average Gas Meter γ Factor	1.000

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

Technician: 12/17/2018

Dry Gas Meter Calibration

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

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

Unit Under Test Previous Calibration	
Date	1/18/2017
γ Factor:	0.997
Allowable Deviation (±5%):	0.04985
Actual Deviation:	0.00
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	145.479	148.058	143.802
Standard DGM Temperature (°F)	71.0	71.0	71.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.146	5.254	5.114
DGM Temperature (°F)	75.0	76.5	77.5
DGM Pressure (in H_2O)	1.80	1.80	1.8
Time (min)			
Net Volume for Standard DGM (ft^3)	5.138	5.229	5.078
Net Volume for DGM (ft^3)	5.146	5.254	5.114

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

Average Gas Meter γ Factor	0.999

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

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ACCREDITED
Calibration Services
Certificate Number 1550.01
Laboratory code 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17
Submitted By: John Steiner
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner

Material	Assumed Density	Range	Tolerance Class
Stainless Steel	7.95 g/cm^3	200mg & 100mg	ASTM Class 1

Method and Traceability

The procedure used for this calibration is NIST IR 6969 SOP 4 Double Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:

100g to 1mg Working Standards Were Calibrated: 03/03/17 Due: 03/31/18 Standards ID: 723318
Mass Comparators Used: MET-05 **Tested by:** D. Thompson

Conventional Mass: "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). "Conventional Value of the Result of Weighing in Air" **(Previously known as "Apparent Mass vs. 8.0g/cm^3).**

Uncertainty Statement: The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor k=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson

QUALITY CONTROL SERVICES
Established 1974
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

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(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: 01/15/16
Purchase Order: 1001
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights
Serial No.: Listed in Table

Manufacturer: Unknown

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.448	760.64	44.58

Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
20lb #098	19.9995450	-206.4	6.4	910
10lb #097	10.0006510	295.3	5.1	450
10lb #051	10.0003421	155.2	5.1	450

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were received in good condition and were within NIST Handbook 105-1 Class F tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 01/15/16

Signature David S. Thompson

QUALITY CONTROL SERVICES
Established 1974
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
CERTIFICATE #1550.01

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

Report Number: DIRI0134307497181218

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Sartorius	ENTRIS224-1S	34307497	#107	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
g	0.0001	QC012	12/18/18	6/13/18	12/2019

FUNCTIONAL CHECKS

ECCENTRICITY
Test Wt: 100 Tol: 0.0003
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

LINEARITY
Test Wt: 50 x 4 Tol: 0.0002
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

STANDARD DEVIATION
Test Wt: 100 Tol: 0.0001

1. 100.0001	5. 100.0002	9. 100.0001
2. 100.0001	6. 100.0001	10. 100.0001
3. 100.0001	7. 100.0001	**Result**
4. 100.0001	8. 100.0002	0.00004

ENVIRONMENTAL CONDITIONS
☐ Good ☑ Fair ☐ Poor
Temperature: 21.3°C

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	200.0002	200.0001	0.00014
100	100.0001	100.0001	0.00014
50	50.0003	50.0001	0.00014
20	20.0001	20.0001	0.00014
1	1.0001	1.0000	0.00014
0.1	0.1000	0.1000	0.00014

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	R.L./Troemner	10kg to 1mg	G782	1/3/18	1/2019	20172421

Permanent Information Concerning this Equipment:
12 month calibration cycle.

Comments/Info Concerning this Calibration:
12/18 - RH = 56%. Adjusted span.

Report prepared/reviewed by: ServiceTech X **Date:** 12/28/18

Technician: R.Kauble
Signature:

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

DICK MUNNS COMPANY
LIQUID & GAS FLOW CALIBRATION

ISO 17025 IAS ACCREDITED CL-122

CERTIFICATE OF CALIBRATION

CUSTOMER:	**PFS-TECO :** CLACKAMAS, OR	**CALIBRATION DATE:**	03/14/2019
PO NUMBER:	N/A	**CALIBRATION DUE:**	03/14/2020
INST. MANUFACTURER:	DWYER	**PROCEDURE:**	T.O.33K6-4-1769-1
INST. DESCRIPTION:	VELOMETER	**CALIBRATION FLUID:**	AIR @ 14.7 PSIA 70°F
MODEL NUMBER:	471	**RECEIVED CONDITION:**	WITHIN MFG. SPECS.
SERIAL NUMBER:	CP288559 (ID# 095)	**LEFT CONDITION:**	WITHIN MFG. SPECS.
RATED UNCERTAINTY:	SEE NOTES BELOW.	**AMBIENT CONDITIONS:**	762 mm HGA 43% RH 69°F
UNCERTAINTY GIVEN:	± .20% RD ; k=2	**CERTIFICATE FILE #:**	490265.2019

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

NOTES CONT. : Q.MANUAL IM 1.5 REV 2017.1 DATED 7-18-2017

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM STD. ACTUAL DEG. F
64	65	0 TO 200°F	0 TO 200°F
110	112	43.4	43.5
206	210	69.0	68.9
498	509	99.4	99.2
503	505		
1049	1058		
1497	1514		
509	513		
3419	3460		
4992	5068		
5136	5235		
13928	14232		

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

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) used and the unit under test (UUT) is a minimum of 4:1. unless otherwise noted. Calibration has been performed per the shown procedure number. in accordance with ISO 10012:2003. ISO 17025:2005. ANSI/NCSL-Z-540.3. and/or MIL-STD-45662A. Test methods: API2530-92 & ASME MFC-3M-1989.

Dick Munns Company • 11133 Winners Circle • Los Alamitos. CA 90720
Phone (714) 827-1215 • Fax (714) 827-0823

Date: 3/14/2019 Approved By: Calibration Technician:

Bulletin D-57

Model 1430 Microtector® Electronic Point Gage

Installation and Operating Instructions

Model 1430 Microtector® Portable Electronic Point Gage combines modern, solid-state integrated circuit electronics with a time-proven point gage manometer to provide fast, accurate pressure measurements.

SPECIFICATIONS AND FEATURES*

- Accurate and repeatable to ± .00025 inches water column
- Pressure range: 0 - 2″ w.c., positive, negative, or differential pressures
- Non-toxic and inexpensive gage fluid consists of distilled water mixed with a small amount of fluorescein green color concentrate
- Convenient, portable, lightweight and self-contained, the unit requires no external power connections and is operated by a 1.5 volt penlight cell
- A.C. detector current eliminates point plating, fouling and erosion
- Micrometers are manufactured in accordance with ASME B89.1.13-2001, and are traceable to a standard at the National Institute of Standards and Technology
- Three-point mounting, dual leveling adjustment, and circular level vial assure rapid setup
- Durablock® precision-machined acrylic plastic gage body
- Sensitive 0 - 50 microamp D.C. meter acts as a detector and also indicates battery and probe condition
- Heavy 2″ thick steel base plate provides steady mounting
- Top-quality glass epoxy circuit board and solid-state, integrated circuit electronics
- Electronic enclosure of tough, molded styrene acrylonitrile provides maximum protection to components yet allows easy access to battery compartment
- Rugged sheet steel cover and carrying case protects the entire unit when not in use
- Accessories included are (2) 3-foot lengths Tygon® tubing, (2) 1/8″ pipe thread adapters and 3/4 oz. bottle of fluorescein green color concentrate with wetting agent

Maximum pressure: 100 psig with optional pipe thread connections.

Tygon® is a registered trademark of Saint-Gobain Corporation

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

PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Tel: (323) 585-2154 Fax:(714) 542-6689
PGVPID: F22017

DocNumber: 000113537

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD
TUALATIN OR 97062

Praxair Order Number: 70337802
Customer P. O. Number:
Customer Reference Number:

Fill Date: 8/7/2017
Part Number: NI CD17CO8E-AS
Lot Number: 70086721903
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure & Volume: 1290 psig 99 cu ft.

Certified Concentration:

Expiration Date: 8/11/2025
Cylinder Number: CC700832

			NIST Traceable Analytical Uncertainty:
4.33	%	CARBON MONOXIDE	± 0.5 %
16.93	%	CARBON DIOXIDE	± 0.3 %
16.99	%	OXYGEN	± 0.2 %
Balance		NITROGEN	

Certifcation Information: Certification Date: 8/11/2017 Term: 96 Months Expiration Date: 8/11/2025

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 O2 IR boardening effect. O2 responses have been corrected for CO2 interference.

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

1. Component: CARBON MONOXIDE

Requested Concentration: 4.25 %
Certified Concentration: 4.33 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 7/23/2017

Reference Standard Type: GMIS
Ref. Std. Cylinder #: CC242633
Ref. Std. Conc: 5.00%
Ref. Std. Traceable to SRM #: 2642a
SRM Sample #: 51-D-23
SRM Cylinder #: FF23106

First Analysis Data: Date: 8/11/2017

Z:	0	R:	5	C:	4.33	Conc:	4.333
R:	4.99	Z:	0	C:	4.33	Conc:	4.333
Z:	0	C:	4.32	R:	5	Conc:	4.323

UOM: % **Mean Test Assay:** 4.33 %

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:** 0 %

2. Component: CARBON DIOXIDE

Requested Concentration: 17 %
Certified Concentration: 16.93 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 7/20/2017

Reference Standard Type: GMIS
Ref. Std. Cylinder #: SA10234
Ref. Std. Conc: 20.02%
Ref. Std. Traceable to SRM #: RGM#CC28
SRM Sample #: N/A
SRM Cylinder #: RGM#CC28033

First Analysis Data: Date: 8/11/2017

Z:	0	R:	20.08	C:	16.99	Conc:	16.936
R:	20.08	Z:	0	C:	16.99	Conc:	16.936
Z:	0	C:	16.98	R:	20.09	Conc:	16.926

UOM: % **Mean Test Assay:** 16.933 %

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:** 0 %

PRAXAIR
Making our planet more productive

DocNumber: 223791

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

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

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

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

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

Certified Concentration

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

ProSpec EZ Cert

Certification Information:

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

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1
Do Not Use this Standard if Pressure is less than 100 PSIG.

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

Analytical Data:

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

1. Component: Carbon dioxide

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

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

First Analysis Data:							Date	09/05/2018
Z:	0	R:	14.02	C:	10	Conc:	10	
R:	14.02	Z:	0	C:	10	Conc:	10	
Z:	0	C:	10	R:	14.02	Conc:	10	
UOM:	%			Mean Test Assay:			10	%

Second Analysis Data:							Date	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%			Mean Test Assay:				%

2. Component: Carbon monoxide

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

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

First Analysis Data:							Date	09/05/2018
Z:	0	R:	2.48	C:	2.51	Conc:	2.51	
R:	2.48	Z:	0	C:	2.51	Conc:	2.51	
Z:	0	C:	2.51	R:	2.48	Conc:	2.51	
UOM:	%			Mean Test Assay:			2.51	%

Second Analysis Data:							Date	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%			Mean Test Assay:				%

3. Component: Oxygen

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

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

First Analysis Data:							Date	09/05/2018
Z:	0	R:	9.88	C:	10.49	Conc:	10.49	
R:	9.88	Z:	0	C:	10.5	Conc:	10.5	
Z:	0	C:	10.5	R:	9.88	Conc:	10.5	
UOM:	%			Mean Test Assay:			10.5	%

Second Analysis Data:							Date	
Z:	0	R:	0	C:	0	Conc:	0	
R:	0	Z:	0	C:	0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0	
UOM:	%			Mean Test Assay:				%

Analyzed By Danielle Burns

Certified By Jose Vasquez

Verification of Standardization

of

Tape Measure

by

Advanced Calibration Technologies
28111 S.E. Wally Road
Boring, OR 97009
1-800-259-5058

ACCREDITED
Calibration
Cert# 1342.01

Customer: PFS Teco, Inc	Street: 11785 Southeast Highway 212 Suite 305
City: Clackamas State: OR	Zip: 97015 Location: In House
Machine Manufacturer: Dewalt	Model: 16' Tape Measure
Capacity: 0.000 - 192.000 inches 0.125 Divisions	Serial #: 090
Calibration Cycle: 12 Months	Lab ID#: #090
Previous Calibration Date: January 2019	Calibration Procedure: Ad-Tek SR
Equipment Used: Gauge Blocks S/N: ADGB002	Action Recommended:
If Other, Explain:	

Verification Data

Purpose:
This method provides instructions for checking the critical dimensions of the equipment.
Tolerance:
Equipment shall meet the dimensional tolerances specified in the applicable test method.
Procedure:
Verified using manufacturer's procedures.

Actual Dimensions (inches)	Unit Under Test As Found (inches)	Unit Under Test As Left (inches)	Difference (inches)
0.0000	0.000	0.000	0.000
0.1250	0.050	0.050	-0.075
0.2500	0.250	0.250	0.000
0.5000	0.500	0.500	0.000
0.7500	0.750	0.750	0.000
1.0000	1.000	1.000	0.000
3.0000	3.000	3.000	0.000
5.0000	5.000	5.000	0.000
7.0000	7.000	7.000	0.000
9.0000	9.000	9.000	0.000
12.0000	12.000	12.000	0.000

The overall condition of the device as found:	Within Specification
The overall condition of the device as left:	Within Specification
The measurement of uncertainty (MU) was calculated to be:	0.00060

File No: PFS-101666-0119D0120-AH-SR-090

Temperature: 72.1°F Humidity: 41.1%

The equipment used in the verification of this instrument has been calibrated and is NIST traceable.
The uncertainty of calibration was estimated at the 95% confidence level, coverage factor (k=2).

Remarks:

This certificate of verification is issued as a statement of fact that on the date of verification the above instrument had an accuracy as indicated and was calibrated to meet the requirements of the manufacturer's specifications. This certificate should not be construed or regarded as a guarantee or warranty of any kind that the instrument will retain the same percentage of accuracy as determined on the date when the verification was performed and reported. Ad-Tek, Inc. hereby expressly disclaims any and all liability for damage or loss by all parties arising or resulting from deterioration, obsolescence, malfunction, subsequent calibration performed by another agency or substandard performance of said instrument.

Service Technician: Alisa Houser — Date of Service: January 16, 2019

Technical Manager: Nicole Ostrowski — Date Next Due: January 2020

We sincerely appreciate your business and thank you for selecting Advanced Calibration Technologies, Inc. for servicing your equipment.
To reschedule, please call (800) 259-5058. Thank You.

Verification of Standardization

of

Calipers

by

Advanced Calibration Technologies
28111 S.E. Wally Road
Boring, OR 97009
1-800-259-5058

ACCREDITED
Calibration
Cert# 1342.01

Customer: PFS Teco, Inc	Street: 11785 Southeast Highway 212 Suite 305
City: Clackamas State: OR	Zip: 97015 Location: In House
Machine Manufacturer: General	Model: 6" Digital Caliper
Capacity: 0.0000 - 6.0000 inches 0.0005 Divisions	Serial #: 092
Calibration Cycle: 12 Months	Lab ID#: 092
Previous Calibration Date: January 2018	Calibration Procedure: Ad-Tek DC
Equipment Used: Gauge Blocks S/N: ADGB002	Action Recommended:
If Other, Explain:	

Verification Data

Purpose:

This method provides instructions for checking the ctical dimensions of the inside diameter of the equipment.

Tolerance:

Equipment shall meet the dimensional tolerances specified by the manufacter for the inside diameter.

Procedure:

Verified using the procedure to meet manufactrer's tolerance for inside diameter.

Actual Dimensions (inches)	Unit Under Test As Found (inches)	Unit Under Test As Left (inches)	Difference (inches)
0.0000	0.0000	0.0000	0.0000
0.0500	0.0500	0.0500	0.0000
0.1000	0.1000	0.1000	0.0000
0.1010	0.1010	0.1010	0.0000
0.1050	0.1050	0.1050	0.0000
0.1100	0.1100	0.1100	0.0000
0.1500	0.1500	0.1500	0.0000
0.5000	0.5000	0.5000	0.0000
1.0000	1.0000	1.0000	0.0000
3.0000	2.9995	2.9995	-0.0005
5.0000	4.9990	4.9990	-0.0010

The overall condition of the device as found:	Within Specification
The overall condition of the device as left:	Within Specification
The measurement of uncertainty (MU) was calculated to be:	0.00062

This certificate does not reflect meausrements for inside jaws, step height, or depth.

File No: PFS-101666-0119D0120-AH-DC-092

Temperature: 68.2°F Humidity: 41.6%

The equipment used in the verification of this instrument has been calibrated and is NIST traceable.
The uncertainty of calibration was estimated at the 95% confidence level, coverage factor (k=2).

Remarks:

Service Technician: Alisa Houser	Date of Service: January 15, 2019
Technical Manager: Nicole Ostrowski	Date Next Due: January 2020

We sincerely appreciate your business and thank you for selecting Advanced Calibration Technologies, Inc. for servicing your equipment.
To reschedule, please call (800) 259-5058. Thank You.

J-2000

owner's manual

DELMHORST®
INSTRUMENT CO.
WHEN ACCURACY IS THE POINT.™

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

ilac-MRA A2LA ACCREDITED A2LA Certificate No. 1750.01 Calibration

Cert. No.: 4198-9765787

Traceable® Certificate of Calibration for Hand Held Barometer

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

Instrument Identification:

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

Standards/Equipment:

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

Certificate Information:

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

Test Conditions: 62.73%RH 23.92°C 1018mBar

Calibration Data:

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

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

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

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

Nicol Rodriguez

Nicol Rodriguez, Quality Manager

Aaron Judice, Technical Manager

Note :

Maintaining Accuracy:

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

Recalibration:

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

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

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