



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
WASHINGTON, D.C. 20460

OFFICE OF  
ENFORCEMENT AND  
COMPLIANCE ASSURANCE

July 19, 2023

Mr. Guillaume Thibodeau-Fortin, P. Eng.  
Laboratory Engineer  
Stove Builder International Inc.  
250 Rue De Copenhagen  
Saint-Augustin-de-Desmaures  
Quebec, Canada  
G3A 2H3

Re: 1.7R Series: Blackcomb II, Escape 1500, Déco II, Columbia II, Savannah II, FW2800, Osburn 1700, Inspire 1700, Harmony 1.7, Solution 1.7, Blue Ridge 200P, Blue Ridge 200L, HES170, Gateway 1700, Escape 1500-I, CW2800, Osburn 1700-I, Matrix 1700-I, Inspire 1700-I, Destination 1.7, Solution 1.7-I, Blue Ridge 200-I, HEI170, and Archway 1700 Non-Catalytic Wood Heater Models; Certificate of Compliance Number 132-18

Dear Mr. Thibodeau-Fortin:

The United States Environmental Protection Agency has reviewed the July 5, 2023<sup>1</sup>, certification test report documenting the retest of the above-referenced models that was conducted following the agency's withdrawal of the Alternative Cordwood Test Method (ATM) ALT-125<sup>2</sup> and has also reviewed the July 12, 2023<sup>3</sup>, Certification of Conformity, including supporting documentation. As a result of our review, the EPA has determined that the test is a valid certification test demonstrating compliance with the applicable emission standard and conducted in accordance with the 2015 New Source Performance Standard (NSPS) for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces at 40 CFR Part 60, Subpart AAA (2015 NSPS). Therefore, the EPA is reissuing Certificate of Compliance Number 132-18 with the updated emissions rate, heat output range, overall heating efficiency, and carbon monoxide emission rate resulting from the certification retest, as provided below. Certification under the 2015 NSPS is valid through July 19, 2028. This letter serves as your wood heater

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<sup>1</sup> Revised on July 12, 2023.

<sup>2</sup> On January 24, 2022, EPA announced the withdrawal of broadly applicable alternative test method approval decisions for Alternatives 125 and 127 (or ALT-125 and ALT-127) that the agency made in 2018 under the 2015 Wood Heater Rule allowing changes to the ASTM E3053 test method. The withdrawal of ALT-125 and ALT-127 test methods became effective on February 23, 2022. See <https://www.federalregister.gov/documents/2022/01/24/2022-01298/withdrawal-of-broadly-applicable-alternative-test-methods>.

<sup>3</sup> Revised on July 13, 2023.

Certificate of Compliance. Please refer to the above-referenced Certificate of Compliance number in all future correspondence.

Based on the above-referenced test report prepared by PFS-TECO demonstrating compliance with the American Society for Testing and Materials (ASTM) E3053 test method, the November 1, 2022, Alternate Test Method (ATM)<sup>4</sup> and the information provided in your July 6, 2023, application, the above-referenced models are certified as meeting the 2015 NSPS. Under the 2015 NSPS and based on Intertek Testing Services NA, Inc.'s above-referenced Certification of Conformity, the models' emission rate of 2.4 g/hr meets the 2020 NSPS particulate matter cordwood emissions limit of 2.5 g/hr. The heat output range and overall heating efficiency for the above-referenced models are 9,800 – 52,200 BTU/hr and 68%, respectively. This model line's carbon monoxide emission rate is 1.7 g/min.

This Certificate of Compliance is valid for the above-referenced models and cannot be transferred to another model line without applying for another Certificate of Compliance. This Certificate of Compliance allows you to advertise and sell the above-referenced models through July 19, 2028. Thereafter, you may not advertise for sale, offer for sale, or sell wood heaters under this Certificate of Compliance without applying for and obtaining another Certificate of Compliance.

All wood heaters manufactured or sold under this Certificate of Compliance must comply with EPA labeling requirements found at § 60.536. These provisions require each wood heater to have a permanent label affixed to it, including the month and year of manufacture, model name or number, serial number, certification test emission value, test method, standard met, and compliance certification statement.

In addition, you must comply with all applicable requirements of the regulation, including:

1. Conducting a third-party certifier-approved quality assurance program that ensures that all units within a model line are similar to the wood heater submitted for certification testing in all respects that would affect emissions and are in compliance with the applicable emission limit, pursuant to § 60.533(m);
2. Applying for recertification whenever any change is made to the above-referenced models that affects or is presumed to affect the particulate matter emission rate for the model line, pursuant to § 60.533(k)(1);
3. Providing an owner's manual that includes the information listed in § 60.536(g)(1) with each affected wood heater model offered for sale;
4. Placing a copy of the full non-Confidential Business Information (non-CBI) certification test report and summary of the test report on the manufacturer's website and available to the public

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<sup>4</sup> November 1, 2022, letter from Steffan M. Johnson, Group Leader, Measurement Technology Group, Office of Air Quality Planning and Standards, to Bernard Blouin, Mechanical Engineer, Stove Builder International Inc., approving a request to use the American Society of Testing and Materials (ASTM) E3053-18 as the alternative cord wood test method when conducting certification testing as required by Subpart AAA, Section 60.534(a)(2).

within 30 days after the EPA issues a Certificate of Compliance, pursuant to § 60.533(b)(12). The up-to-date non-CBI certification test report and summary (if later revised) should remain posted on the manufacturer's website for as long as the model line is manufactured and offered for sale in the U.S.;

5. Submitting a report to the EPA every two years following issuing a Certificate of Compliance for each model line. This report must include the sales for each model by state and certify that no changes in the design or manufacture of this model line have been made that require recertification under § 60.533(k);
6. Retaining records and submitting reports as required at § 60.537; and
7. Submitting wood heaters for audit testing if selected by the EPA under §§ 60.533(n)(1)(i) and (2)(i).

Failure to comply with these requirements may result in revoking this Certificate of Compliance and enforcement action, including penalties as specified under the Clean Air Act. Pursuant to the EPA-approved ATM, you must also include your approval letter in the certification test report for posting on your website. To promote transparency in implementing the Wood Heater Program, we request that manufacturers submit the Uniform Resource Locator (URL) or web address where the test report is posted to [WoodHeaterReports@epa.gov](mailto:WoodHeaterReports@epa.gov) within ten (10) days of posting.

Once EPA has verified that the full non-CBI certification test report documenting the retest has been posted on the manufacturer's website, the agency will continue to include the above-referenced models in the EPA-Certified Wood Heater Database.

If you have any questions concerning this letter, please contact the Wood Heater Program at [WoodHeaterReports@epa.gov](mailto:WoodHeaterReports@epa.gov).

Sincerely,

Elizabeth Vizard  
Acting Director  
Monitoring, Assistance, and Media Programs Division  
Office of Compliance  
Office of Enforcement and Compliance Assurance

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# Stove Builder International

Project # 23-161

Model: BlackComb II (1.7R Series)

Type: Non-catalytic Wood Fired Heater

July 5, 2023

Revised: July 12, 2023

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**ASTM E3053 Standard Test Method for  
Determining Particulate Matter Emissions  
from Wood Heaters Using Cordwood Test  
Fuel (EPA Alternate Test Method)**

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Contact: Mr. Guillaume Thibodeau-Fortin  
250 Rue de Copenhague  
Saint-Augustin-de-Desmaures, QC G3A 2H3  
Canada  
[gthibodeaufortin@sbi-international.com](mailto:gthibodeaufortin@sbi-international.com)

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Prepared by: Sebastian Button,  
Laboratory Supervisor

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**11785 SE Highway 212 – Suite 305  
Clackamas, OR 97015-9050  
(503) 650-0088  
[WWW.PFSTECO.COM](http://WWW.PFSTECO.COM)**

## Revision Summary

July 5, 2023 – Original Issue

July 12, 2023 – The following revisions were made per a request from EPA:

- The pre-test conditioning data sheets were updated to include photos of air settings used for condition burns, see page 25 in Appendix A of the Non-CBI Report.

- The ATM letter in Appendix A was reformatted so the digital signature is preserved, see page 77 in Appendix A of the Non-CBI Report.

- Test data from the original set of certification tests performed in December 2022 was added to Appendix A. This data is for reference only, none of these tests are part of the certification tests documented in the main body of the report. See pages 369-714 in Appendix A of the Non-CBI Report.

## Contents

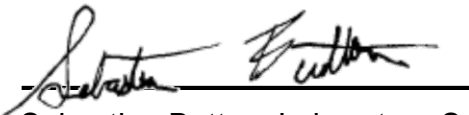
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## Affidavit

PFS-TECO was contracted by Stove Builder International (SBI) to provide testing services for the BlackComb II 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 by EPA under an Alternate Test Method (ATM) in a letter to the manufacturer dated November 1, 2022. All testing and associated procedures were conducted at SBI's Saint-Augustin-de-Desmaures Laboratory beginning on 6/6/2023 and ending on 6/9/2023. SBI's laboratory is located at 250 Rue de Copenhague Saint-Augustin-de-Desmaures, QC G3A 2H3. Testing procedures followed ASTM E3053, with variances as described in the ATM. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel*, with variances as described in the ATM. A copy of the EPA ATM letter 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 17025:2017 "Requirements for Testing Laboratories." PFS-TECO is also accredited by Standards Council of Canada to ISO 17065:2012 "Requirements for Bodies Operating Product Certification Systems."

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



Sebastian Button, Laboratory Supervisor

## Introduction

SBI contracted with PFS-TECO to perform EPA certification testing on the BlackComb II Wood-Fired Room Heater. All testing was performed at SBI's Saint-Augustin-de-Desmaures Laboratory. All testing was performed by Sebastian Button.

## Notes

- Prior to the start of testing, 50 hours of conditioning was performed by the manufacturer in accordance with the ATM.
- Prior to the start of testing, the dilution tunnel was cleaned with a steel brush.
- A third separate, independent filter train was utilized to determine 1<sup>st</sup> hour emissions in accordance with the ATM for all test runs.
- A total of 8 test runs were completed. Test runs were performed in accordance with the ATM. All runs have been found to be appropriate, see the Run Narrative section for further detail on each run.
- No fuel pieces were intentionally squared or debarked and met all requirements specified in the ATM. Fuel pieces used for testing had little to no bark due to natural drying, splitting, and impacts caused by multiple moisture measurements.



## Wood Heater Identification and Testing

- Appliance Tested: **BlackComb II**
- Serial Number: **PFS Tracking Number 135**
- Manufacturer: **Stove Builder International**
- Catalyst: **No**
- Heat exchange blower: **Optional**
- Type: **Wood Stove**
- Style: **Free-Standing**
- Date Received: **Monday, June 05, 2023**
- Testing Period – Start: **Tuesday, June 06, 2023**  
Finish: **Friday, June 09, 2023**
- Test Location: **SBI**  
**250 Rue de Copenhague**  
**Saint-Augustin-de-Desmaures, QC G3A 2H3**
- Elevation: **~235 Feet above sea level**
- Test Technician(s): **Sebastian Button**
- Observers: **Guillaume Thibodeau-Fortin and Bernard Blouin**

## 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	Calibration Due Date
SBI-190	5 kg audit weight	10/2/2023
SBI-047	Sample Train A Dry Gas Meter	9/14/2023
SBI-046	Sample Train B Dry Gas Meter	11/25/2023
SBI-346	Sample Train C Dry Gas Meter	8/3/2023
SBI-347	Ambient Sample Train Dry Gas Meter	8/3/2023
SBI-375	Temperature Acquisition System	11/25/2023
SBI-310	Thermo-Hygrometer	12/14/2023
SBI-222	Fuel Bench Scale	3/31/2024
SBI-332	California Analytical ZRE CO <sub>2</sub> /CO/O <sub>2</sub> IR ANALYZER	Prior to Use
SBI-097	Anemometer	2/3/2024
SBI-250	Pressure Transmitter – Tunnel Pressure	2/27/2024
SBI-248	Pressure Transmitter – Flue Draft	2/27/2024
SBI-299	Pressure Transmitter - Meter A System Pressure	2/23/2024
SBI-298	Pressure Transmitter – Meter B System Pressure	2/6/2024
SBI-389	Pressure Gauge – Meter C System	11/30/2023
SBI-390	Pressure Gauge – Ambient System	11/30/2023
SBI-391	Vacuum Gauge – Meter C System	11/30/2023
SBI-392	Vacuum Gauge – Ambient System	11/30/2023
SBI-400	Digital Hygrometer/Psychrometer – Tunnel Dew Point/RH%	5/29/2024
SBI-401	Barometer	2/17/2025
SBI-014	500 x 0.02kg Platform Scale	3/16/2024
SBI-339	Gas Analyzer Calibration Gas	8/3/2024
SBI-338	Gas Analyzer Calibration Gas	8/6/2024
SBI-369	Gas Analyzer Calibration Gas	8/15/2025
SBI-206	Analytical Balance	3/31/2024
PFS-109A/B	Troemner 100mg/200mg Audit Weights	5/9/2027
PFS-094	Moisture Meter Calibration Block	8/19/2023
PFS-210	Tape Measure	1/26/2024
PFS-107	Sartorius Analytical Balance	12/14/2023

## Results

The weighted average emissions rate for the test series was measured to be **2.4 g/hr** with a Higher Heating Value efficiency of **68%**. The average CO emission rate for the test series was **1.7 g/min**. The SBI BlackComb II Wood-Fired Room Heater meets the 2020 cordwood PM emission standard of ≤ 2.5 g/hr per CFR 40 part 60, §60.532 (c).

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

### Summary Table

	High Fire Test #1	Low Fire Test	High Fire Test #2*	Medium Fire Test	High Fire Test #3*	High Fire Test #4	High Fire Test #5	High Fire Test #6
Date	6/6/23	6/6/23	6/7/2023	6/7/23	6/8/2023	6/8/23	6/9/23	6/9/23
Run Number	1	2	3	4	5	6	7	8
PM Emission Rate (g/hr)	3.09	1.90	7.20	1.87	10.26	3.39	5.34	6.56
Burn Rate (kg/hr)	4.07	0.77	3.29	1.14	2.92	3.46	3.79	4.40
Heat Output (BTU/hr)	51,200	9,800	39,700	13,600	35,700	41,000	44,900	52,200
HHV Efficiency (%)	69%	71%	66%	67%	67%	65%	65%	65%
LHV Efficiency (%)	74%	76%	71%	71%	71%	70%	70%	70%
CO Emissions (g/MJ output)	1.90	5.65	1.60	3.25	2.41	3.93	4.19	6.33
CO Emissions (g/kg dry fuel)	24.62	75.88	19.94	40.72	30.19	48.04	51.33	77.34
CO Emissions (g/min)	1.71	0.98	1.12	0.78	1.51	2.83	3.31	5.81
1 <sup>st</sup> Hour Emission Rate (g/hr)	6.57	10.35	12.76	5.01	10.03	6.37	7.57	8.73
Weighting Factor (%)	5%	40%	-	40%	-	5%	5%	5%
<b>Weighted particulate emission average of 6 test runs: 2.4 grams per hour.</b>								
<b>Weighted average HHV efficiency of 6 test runs: 68%.</b>								
<b>Average CO emission rate for 6 test runs: 1.7 grams per minute</b>								
<b>*High fire tests #2 &amp; 3 not included in weighted average. 2/3 of high fire test runs are included per ASTM E3053 section 8.9.1</b>								

## Test Run Narrative

### *Run 1*

Run 1 was performed on 6/6/2023 as a high fire test run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 36 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. The total test time was 107 minutes, main test fuel load burn time was 71 min. The particulate emissions rate from kindling ignition to test completion was 3.09 g/hr. The burn rate of the test fuel load was 4.07 kg/hr. The main test load portion of the run had an overall HHV efficiency of 69%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met.

### *Run 2*

Run 2 was performed on 6/6/2023 as a low fire test run per the ATM. The overall test duration was 508 minutes. The burn rate for the test run was 0.77 kg/hr. The particulate emissions rate for the test run was 1.90 g/hr. The run had an overall HHV efficiency of 71%. All test results were appropriate, valid, and all test criteria were met. One item to note in the test data is that at 185 minutes, the logged scale values moved up slightly (0.06lbs) over the course of a couple minutes. It is unclear why this happened, but the scale/appliance was not touched during the test. Since the increase represents a value smaller than the required scale resolution (0.1 lbs) of the test method, it was determined that this does not have any impact on the validity of the results.

### *Run 3*

Run 3 was performed on 6/7/2023 as a high fire test run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 39 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. The total test time was 125 minutes, main test fuel load burn time was 86 min. The particulate emissions rate from kindling ignition to test completion was 7.19 g/hr. The burn rate of the test fuel load was 3.29 kg/hr. The main test load portion of the run had an overall HHV efficiency of 66%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met. Approximately 65 minutes into the test both sample trains required filter changes as sample rates could not be maintained. Prior to changing the filters, leak checks were performed in accordance with the test method, see run notes for further detail. This test was excluded from the weighted average on a 2/3 basis in accordance with ASTM E3053 section 8.9.1.

### *Run 4*

Run 4 was performed on 6/7/2023 as a medium fire test run per the ATM. The overall test duration was 345 minutes. The burn rate for the test run was 1.14 kg/hr. The particulate

emissions rate for the test run was 1.87 g/hr. The run had an overall HHV efficiency of 67%. All test results were appropriate and valid. There were no anomalies, and all criteria were met.

#### *Run 5*

Run 5 was performed on 6/8/2023 as a high fire test run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 32 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. The total test time was 132 minutes, main test fuel load burn time was 100 min. The particulate emissions rate from kindling ignition to test completion was 10.25 g/hr. The burn rate of the test fuel load was 2.92 kg/hr. The main test load portion of the run had an overall HHV efficiency of 67%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met. Approximately 60 minutes into the test both sample trains required filter changes as sample rates could not be maintained. Prior to changing the filters, leak checks were performed in accordance with the test method, see run notes for further detail. This test was excluded from the weighted average on a 2/3 basis in accordance with ASTM E3053 section 8.9.1.

#### *Run 6*

Run 6 was performed on 6/8/2023 as a high fire test run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 40 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. The total test time was 127 minutes, main test fuel load burn time was 87 min. The particulate emissions rate from kindling ignition to test completion was 3.09 g/hr. The burn rate of the test fuel load was 3.39 kg/hr. The main test load portion of the run had an overall HHV efficiency of 65%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met.

#### *Run 7*

Run 7 was performed on 6/9/2023 as a high fire test run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 33 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. The total test time was 112 minutes, main test fuel load burn time was 79 min. The particulate emissions rate from kindling ignition to test completion was 5.34 g/hr. The burn rate of the test fuel load was 3.79 kg/hr. The main test load portion of the run had an overall HHV efficiency of 65%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met.

*Run 8*

Run 8 was performed on 6/9/2023 as a high fire test run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 37 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. The total test time was 106 minutes, main test fuel load burn time was 69 min. The particulate emissions rate from kindling ignition to test completion was 6.56 g/hr. The burn rate of the test fuel load was 4.40 kg/hr. The main test load portion of the run had an overall HHV efficiency of 65%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met.

## Test Conditions Summary

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

Run	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	70	81	34.6	35.0	29.48	7.25	14.74	21.2%	107
2	81	81	35.0	37.2	29.43	14.74	17.52	21.5%	508
3	76	87	34.8	37.7	29.32	7.15	14.43	20.9%	125
4	87	88	37.7	38.3	29.38	14.43	17.42	20.4%	345
5	77	86	41.7	39.5	29.54	6.81	14.74	22.2%	132
6	81	74	38.6	37.9	29.56	7.23	15.05	20.9%	127
7	78	77	40.8	40.6	29.59	6.89	14.82	20.1%	112
8	79	76	39.4	38.9	29.51	6.83	15.06	20.0%	106

## Appliance Operation and Test Settings

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

### Settings & Run Notes

	Pre-Burn Air Setting	Test Run Air and Fan Settings
<b>Run 1</b>	N/A – Cold Start Ignition	Air control set to high fire test setting, fully open, fan on high.
<b>Run 2</b>	This test is a continuation of Run 1, see above	Air control set to low fire test setting, fully closed, fan on high.
<b>Run 3</b>	N/A – Cold Start Ignition	Air control set to high fire test setting, fully open, fan on high.
<b>Run 4</b>	This test is a continuation of Run 3, see above	Air control set to medium fire test setting, midpoint of control range, fan on high.
<b>Run 5</b>	N/A – Cold Start Ignition	Air control set to high fire test setting, fully open, fan on high.
<b>Run 6</b>	N/A – Cold Start Ignition	Air control set to high fire test setting, fully open, fan on high.
<b>Run 7</b>	N/A – Cold Start Ignition	Air control set to high fire test setting, fully open, fan on high.
<b>Run 8</b>	N/A – Cold Start Ignition	Air control set to high fire test setting, fully open, fan on high.

## Appliance Description

**Models:** The BlackComb II is part of the 1.7R series, which is available under 24 different model numbers, all of which are identical with respect to all parts that may impact emissions performance as specified by 40 CFR 60 § 60.533(k). The models are only different with respect to branding, decorative features, and support method (e.g. freestanding or fireplace insert). Drawings for all models are in Appendix D. See below for model list:

Model Number	Notes
FW2800	Freestanding w/ Pedestal
Blackcomb II	Freestanding w/ Pedestal
Columbia II	Freestanding w/ Legs
Savanah II	Freestanding w/ Pedestal
Escape 1500	Freestanding w/ Pedestal
Deco II	Freestanding w/ Full Width Pedestal
Harmony 1.7	Freestanding w/ Legs, decorative castings
Solution 1.7	Freestanding w/ Legs
Blue Ridge 200P	Freestanding w/ Pedestal, decorative glass engraving
Blue Ridge 200L	Freestanding w/ Legs, decorative glass engraving
Osburn 1700	Freestanding w/Pedestal, decorative castings
Inspire 1700	Freestanding w/ Full Width Pedestal, decorative door
Gateway 1700	Freestanding w/ Pedestal
HES170	Freestanding w/ Pedestal
Escape 1500-I	Insert variant of Escape 1500
Solution 1.7-I	Insert variant of Solution 1.7
Blue Ridge 200-I	Insert variant of Blue Ridge 200P
Osburn 1700-I	Insert variant of Osburn 1700
Inspire 1700-I	Insert variant of Inspire 1700
HEI170	Insert Variant of HES170
CW2800	Insert
Destination 1.7	Insert w/ zero clearance enclosure
Matrix 1700-I	Insert w/ zero clearance enclosure
Archway 1700	Insert

**Appliance Type:** Freestanding Wood-Fired Room Heater

**Total Firebox Volume:** 1.86 ft<sup>3</sup>

**Usable Firebox Volume:** 1.44 ft<sup>3</sup>, see ATM document in Appendix A for further detail on Total versus Usable Firebox Volume.



**Air Introduction System:** Primary combustion air enters the appliance through the air control opening located on the bottom front of the stove. Air is routed up the sides of the firebox, then down into the combustion chamber in front of the door glass. Secondary air brought in through a variable opening on the bottom of the appliance. The secondary air opening is varied by mechanical linkage to the primary air adjustment handle. Secondary air is routed up the back of the firebox and feed into a set of four identical secondary air tubes. Dimensions on all these features can be found in Appendix D.

**Baffles:** Combustion air is routed to the front of the stove with a mineral fiber baffle that sits on top of the secondary air tubes located above the firebox.

**Refractory Insulation:** The firebox is lined with 1 1/4” thick high-density firebrick.

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

**Fan:** A variable speed convection fan is mounted to the rear of the appliance for freestanding variants. On insert variants the fan is mounted to the front of the appliance, under the loading door.

### Appliance Dimensions

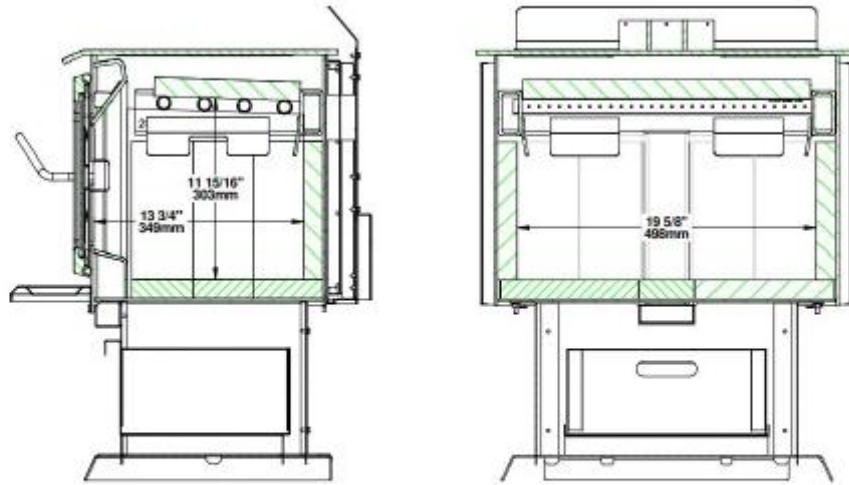
BlackComb II Unit Dimensions – Excluding legs, insert shrouds, etc.

Height	Width	Depth
18.75”	24.5”	24”

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

## Total Firebox Volume Dimension

i. SBI 1.7R Series overall firebox volume (OFV) calculation:

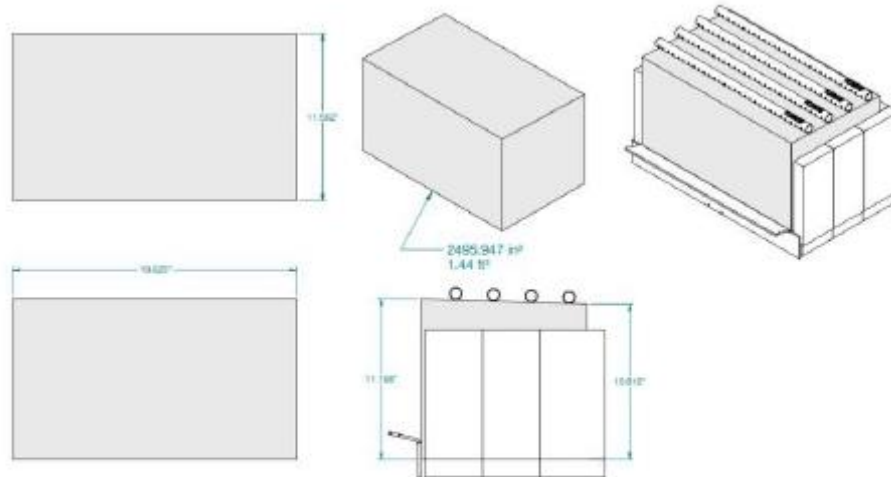


$$OFV = 13.75 \times 19.625 \times 11.9375 = 3221.260 \text{ in}^3$$

$$OFV = \frac{3221.260}{12^3} = 1.86 \text{ ft}^3$$

## Usable Firebox Volume Dimensions

ii. SBI 1.7R Series UFV schematic:



iii. SBI 1.7R Series UFV calculation:

$$UFV = 11.562 \times 19.625 \times \frac{11.188 + 10.812}{2} = 2495.947 \text{ in}^3$$

$$UFV = \frac{2495.947}{12^3} = 1.44 \text{ ft}^3$$

### Appliance Front



### Appliance Left



Appliance Right



Appliance Rear



## Appliance Fire Box



### Appliance Setup



## Test Fuel Properties

Test fuel used was Beech 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

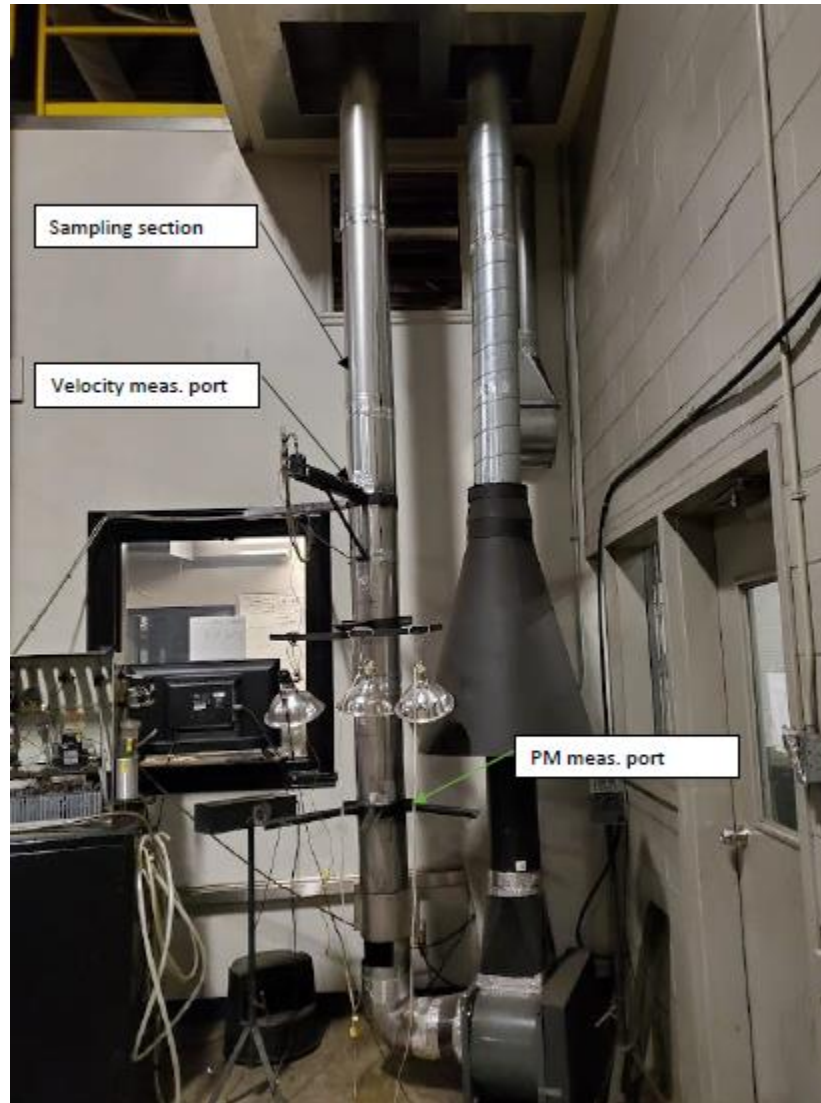


Typical Low Fire Load



## Sampling Locations and Descriptions

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





## Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel is 8 inches in diameter. All sampling conditions per ASTM E2515 were followed. No alternate procedures were used with the exception of caveats described in the ATM: 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. Prior to being placed in the dessicator, sample filters were intially weighed within 1 hour of the post-test leak checks in accordance with the ATM.

## 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: 250 Rue de Copenhague Saint-Augustin-de-Desmaures, QC G3A 2H3 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)

## Unit preburn period

<b>Total preburning time (h)</b>	<b>58.65</b>
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**Model tested:** BlackComb II (1.7R Series)

**Identification number:** QC20221019-RECERTIF1.7-DP-115

Date	Burn cycle	Test run (#)	Duration	Av. Flue	Load type	Fuel added	Moisture
			(min)	(°F)	(-)	(lbs)	(DB%)
2023-05-19	Preload	488	36	482	Kindling & SUF	7.24	15.9
	Condition		88	592	High fire	14.95	19.1
	Load		391	305	Low fire	17.12	19.5
2023-05-24	Preload	492	35	522	Kindling & SUF	7.33	14.5
	Condition		81	619	High fire	14.90	19.3
	Load		509	263	Low fire	17.56	19.5
2023-05-25	Preload	494	34	487	Kindling & SUF	7.14	14.9
	Condition		120	500	High fire	14.51	20.8
	Load		435	282	Low fire	17.40	19.4
2023-05-26	Preload	498	20	422	Kindling & SUF	7.34	15.1
	Condition		95	582	High fire	14.97	20.7
	Load		412	284	Low fire	17.44	19.1
2023-05-29	Preload	502	34	528	Kindling & SUF	7.47	14.7
	Condition		68	668	High fire	14.99	20.2
	Load		355	305	Low fire	16.53	19.2
2023-05-31	Preload	508	33	510	Kindling & SUF	7.22	15.1
	Condition		87	597	High fire	14.93	19.1
	Load		285	367	Medium fire	17.43	18.8
2023-06-01	Preload	514	32	480	Kindling & SUF	7.22	14.8
	Condition		94	568	High fire	14.65	19.2
	Load		275	387	Medium fire	17.08	19.0

High fire air control



Medium fire air control



Low fire air control



1.7R Series Pre-burn Data

2023-05-19

Total time (h)

8.58

Wood Specie: Beech								
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)	(-)	(in.)		(min)	(°F)
2023-05-19 11:21	Kindling & SUF	7.24	15.9	18	16.0	Pre-Charge (min)	36	481.5
2023-05-19 12:01	High fire	14.95	19.1	5	16.0	Conditioning (min)	88	592.4
2023-05-19 13:31	Medium fire	17.12	19.5	5	16.0	Load (min)	391	305.0

		Average Tflue (°F)	481.5	592.4	305.0
		Pre-Charge (min)	36	Conditioning (min)	88
		Load (min)		391	
Air control position	Full open		Full open		Fully closed (or mid point)
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time
0	2023-05-19 11:21	74.4	2023-05-19 12:01	449.7	2023-05-19 13:31
1	2023-05-19 11:22	168.8	2023-05-19 12:02	376.1	2023-05-19 13:32
2	2023-05-19 11:23	186.8	2023-05-19 12:03	408.8	2023-05-19 13:33
3	2023-05-19 11:24	246.7	2023-05-19 12:04	424.4	2023-05-19 13:34
4	2023-05-19 11:25	319.6	2023-05-19 12:05	420.7	2023-05-19 13:35
5	2023-05-19 11:26	345.2	2023-05-19 12:06	424.1	2023-05-19 13:36
6	2023-05-19 11:27	379.5	2023-05-19 12:07	430.7	2023-05-19 13:37
7	2023-05-19 11:28	423.7	2023-05-19 12:08	442.9	2023-05-19 13:38
8	2023-05-19 11:29	460.1	2023-05-19 12:09	454.9	2023-05-19 13:39
9	2023-05-19 11:30	490.6	2023-05-19 12:10	460.5	2023-05-19 13:40
10	2023-05-19 11:31	497.0	2023-05-19 12:11	445.6	2023-05-19 13:41
11	2023-05-19 11:32	499.6	2023-05-19 12:12	432.8	2023-05-19 13:42
12	2023-05-19 11:33	510.2	2023-05-19 12:13	427.7	2023-05-19 13:43
13	2023-05-19 11:34	504.3	2023-05-19 12:14	416.0	2023-05-19 13:44
14	2023-05-19 11:35	499.3	2023-05-19 12:15	450.8	2023-05-19 13:45
15	2023-05-19 11:36	494.2	2023-05-19 12:16	475.3	2023-05-19 13:46
16	2023-05-19 11:36	494.2	2023-05-19 12:17	503.2	2023-05-19 13:47
17	2023-05-19 11:41	527.1	2023-05-19 12:18	538.8	2023-05-19 13:48
18	2023-05-19 11:42	532.0	2023-05-19 12:19	553.7	2023-05-19 13:49
19	2023-05-19 11:43	539.7	2023-05-19 12:20	564.1	2023-05-19 13:50
20	2023-05-19 11:44	543.4	2023-05-19 12:21	565.7	2023-05-19 13:51
21	2023-05-19 11:45	555.5	2023-05-19 12:22	564.1	2023-05-19 13:52
22	2023-05-19 11:46	566.7	2023-05-19 12:23	558.7	2023-05-19 13:53
23	2023-05-19 11:47	572.7	2023-05-19 12:24	561.6	2023-05-19 13:54
24	2023-05-19 11:48	570.7	2023-05-19 12:25	562.3	2023-05-19 13:55
25	2023-05-19 11:49	575.6	2023-05-19 12:26	565.6	2023-05-19 13:56
26	2023-05-19 11:50	577.9	2023-05-19 12:27	572.6	2023-05-19 13:57
27	2023-05-19 11:51	576.2	2023-05-19 12:28	579.3	2023-05-19 13:58
28	2023-05-19 11:52	570.9	2023-05-19 12:29	583.7	2023-05-19 13:59
29	2023-05-19 11:53	579.9	2023-05-19 12:30	587.9	2023-05-19 14:00
30	2023-05-19 11:54	587.0	2023-05-19 12:31	592.8	2023-05-19 14:01
31	2023-05-19 11:55	582.1	2023-05-19 12:32	598.0	2023-05-19 14:02
32	2023-05-19 11:56	568.6	2023-05-19 12:33	604.7	2023-05-19 14:03
33	2023-05-19 11:57	562.6	2023-05-19 12:34	611.2	2023-05-19 14:04
34	2023-05-19 11:58	553.3	2023-05-19 12:35	617.9	2023-05-19 14:05
35	2023-05-19 11:59	544.8	2023-05-19 12:36	621.3	2023-05-19 14:06
36	2023-05-19 12:00	535.2	2023-05-19 12:37	625.2	2023-05-19 14:07
37			2023-05-19 12:38	628.8	2023-05-19 14:08
38			2023-05-19 12:39	629.5	2023-05-19 14:09
39			2023-05-19 12:40	633.1	2023-05-19 14:10
40			2023-05-19 12:41	636.7	2023-05-19 14:11
41			2023-05-19 12:42	638.7	2023-05-19 14:12
42			2023-05-19 12:43	641.7	2023-05-19 14:13
43			2023-05-19 12:44	643.3	2023-05-19 14:14
44			2023-05-19 12:45	645.4	2023-05-19 14:15
45			2023-05-19 12:46	646.2	2023-05-19 14:16
46			2023-05-19 12:47	647.5	2023-05-19 14:17
47			2023-05-19 12:48	647.5	2023-05-19 14:18
48			2023-05-19 12:49	649.3	2023-05-19 14:19
49			2023-05-19 12:50	653.1	2023-05-19 14:20
50			2023-05-19 12:51	655.5	2023-05-19 14:21
51			2023-05-19 12:52	658.4	2023-05-19 14:22
52			2023-05-19 12:53	661.9	2023-05-19 14:23
53			2023-05-19 12:54	668.0	2023-05-19 14:24
54			2023-05-19 12:55	672.0	2023-05-19 14:25
55			2023-05-19 12:56	675.9	2023-05-19 14:26
56			2023-05-19 12:57	691.1	2023-05-19 14:27
57			2023-05-19 12:58	697.7	2023-05-19 14:28
58			2023-05-19 12:59	698.3	2023-05-19 14:29
59			2023-05-19 13:00	696.9	2023-05-19 14:30
60			2023-05-19 13:01	696.2	2023-05-19 14:31
61			2023-05-19 13:02	693.7	2023-05-19 14:32
62			2023-05-19 13:03	688.8	2023-05-19 14:33
63			2023-05-19 13:04	684.7	2023-05-19 14:34
64			2023-05-19 13:05	679.8	2023-05-19 14:35
65			2023-05-19 13:06	677.1	2023-05-19 14:36
66			2023-05-19 13:07	675.6	2023-05-19 14:37
67			2023-05-19 13:08	672.7	2023-05-19 14:38

68		2023-05-19 13:09	670.1	2023-05-19 14:39	532.3
69		2023-05-19 13:10	668.9	2023-05-19 14:40	533.1
70		2023-05-19 13:11	668.3	2023-05-19 14:41	533.8
71		2023-05-19 13:12	666.7	2023-05-19 14:42	534.5
72		2023-05-19 13:13	662.7	2023-05-19 14:43	534.0
73		2023-05-19 13:14	660.7	2023-05-19 14:44	532.1
74		2023-05-19 13:15	658.4	2023-05-19 14:45	531.2
75		2023-05-19 13:16	655.5	2023-05-19 14:46	529.7
76		2023-05-19 13:17	646.9	2023-05-19 14:47	527.2
77		2023-05-19 13:18	638.8	2023-05-19 14:48	525.0
78		2023-05-19 13:19	631.4	2023-05-19 14:49	524.6
79		2023-05-19 13:20	625.4	2023-05-19 14:50	521.6
80		2023-05-19 13:21	615.7	2023-05-19 14:51	518.2
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82		2023-05-19 13:23	590.9	2023-05-19 14:53	504.7
83		2023-05-19 13:24	581.4	2023-05-19 14:54	498.8
84		2023-05-19 13:25	574.4	2023-05-19 14:55	494.5
85		2023-05-19 13:26	569.8	2023-05-19 14:56	492.1
86		2023-05-19 13:26	568.6	2023-05-19 14:57	491.2
87		2023-05-19 13:27	562.9	2023-05-19 14:58	489.8
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89				2023-05-19 15:00	482.0
90				2023-05-19 15:01	478.7
91				2023-05-19 15:02	473.6
92				2023-05-19 15:03	466.8
93				2023-05-19 15:04	461.7
94				2023-05-19 15:05	456.8
95				2023-05-19 15:06	454.0
96				2023-05-19 15:07	450.7
97				2023-05-19 15:08	446.9
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99				2023-05-19 15:10	439.1
100				2023-05-19 15:11	432.9
101				2023-05-19 15:12	428.5
102				2023-05-19 15:13	423.4
103				2023-05-19 15:14	418.8
104				2023-05-19 15:15	413.8
105				2023-05-19 15:16	409.3
106				2023-05-19 15:17	404.2
107				2023-05-19 15:18	399.0
108				2023-05-19 15:19	393.6
109				2023-05-19 15:20	384.5
110				2023-05-19 15:21	374.5
111				2023-05-19 15:22	366.4
112				2023-05-19 15:23	359.8
113				2023-05-19 15:24	353.7
114				2023-05-19 15:25	348.6
115				2023-05-19 15:26	344.0
116				2023-05-19 15:27	339.7
117				2023-05-19 15:28	336.0
118				2023-05-19 15:29	332.4
119				2023-05-19 15:30	328.9
120				2023-05-19 15:31	325.8
121				2023-05-19 15:32	322.9
122				2023-05-19 15:33	319.9
123				2023-05-19 15:34	317.6
124				2023-05-19 15:35	315.1
125				2023-05-19 15:36	312.5
126				2023-05-19 15:37	310.4
127				2023-05-19 15:38	308.1
128				2023-05-19 15:39	304.2
129				2023-05-19 15:40	301.0
130				2023-05-19 15:41	297.9
131				2023-05-19 15:42	294.7
132				2023-05-19 15:43	292.6
133				2023-05-19 15:44	290.7
134				2023-05-19 15:45	288.1
135				2023-05-19 15:46	286.4
136				2023-05-19 15:47	284.5
137				2023-05-19 15:48	282.3
138				2023-05-19 15:49	280.4
139				2023-05-19 15:50	278.5
140				2023-05-19 15:51	276.6
141				2023-05-19 15:52	274.7
142				2023-05-19 15:53	273.1
143				2023-05-19 15:54	271.5
144				2023-05-19 15:55	270.3
145				2023-05-19 15:56	268.9
146				2023-05-19 15:57	267.4
147				2023-05-19 15:58	266.0

148				2023-05-19 15:59	265.1
149				2023-05-19 16:00	264.1
150				2023-05-19 16:01	262.5
151				2023-05-19 16:02	261.5
152				2023-05-19 16:03	260.4
153				2023-05-19 16:04	259.3
154				2023-05-19 16:05	258.6
155				2023-05-19 16:06	257.7
156				2023-05-19 16:07	256.7
157				2023-05-19 16:08	255.4
158				2023-05-19 16:09	254.6
159				2023-05-19 16:10	254.2
160				2023-05-19 16:11	253.6
161				2023-05-19 16:12	252.7
162				2023-05-19 16:13	251.7
163				2023-05-19 16:14	250.7
164				2023-05-19 16:15	250.4
165				2023-05-19 16:16	249.4
166				2023-05-19 16:17	248.9
167				2023-05-19 16:18	248.4
168				2023-05-19 16:19	248.0
169				2023-05-19 16:20	247.2
170				2023-05-19 16:21	246.3
171				2023-05-19 16:22	245.7
172				2023-05-19 16:23	245.2
173				2023-05-19 16:24	245.0
174				2023-05-19 16:25	244.6
175				2023-05-19 16:26	244.1
176				2023-05-19 16:27	243.6
177				2023-05-19 16:28	243.4
178				2023-05-19 16:29	243.5
179				2023-05-19 16:30	242.9
180				2023-05-19 16:31	242.5
181				2023-05-19 16:32	242.2
182				2023-05-19 16:33	241.3
183				2023-05-19 16:34	241.1
184				2023-05-19 16:35	240.8
185				2023-05-19 16:36	240.4
186				2023-05-19 16:37	240.5
187				2023-05-19 16:38	239.7
188				2023-05-19 16:39	239.9
189				2023-05-19 16:40	239.2
190				2023-05-19 16:41	238.9
191				2023-05-19 16:42	238.7
192				2023-05-19 16:43	238.1
193				2023-05-19 16:44	237.8
194				2023-05-19 16:45	237.6
195				2023-05-19 16:46	237.4
196				2023-05-19 16:47	237.3
197				2023-05-19 16:48	237.2
198				2023-05-19 16:49	237.2
199				2023-05-19 16:50	237.3
200				2023-05-19 16:51	237.2
201				2023-05-19 16:52	237.0
202				2023-05-19 16:53	236.8
203				2023-05-19 16:54	237.3
204				2023-05-19 16:55	237.0
205				2023-05-19 16:56	236.6
206				2023-05-19 16:57	236.0
207				2023-05-19 16:58	236.2
208				2023-05-19 16:59	236.2
209				2023-05-19 17:00	235.7
210				2023-05-19 17:01	235.7
211				2023-05-19 17:02	235.6
212				2023-05-19 17:03	235.2
213				2023-05-19 17:04	234.6
214				2023-05-19 17:05	234.5
215				2023-05-19 17:06	234.2
216				2023-05-19 17:07	234.7
217				2023-05-19 17:08	234.7
218				2023-05-19 17:09	234.7
219				2023-05-19 17:10	234.5
220				2023-05-19 17:11	234.7
221				2023-05-19 17:12	234.7
222				2023-05-19 17:13	234.3
223				2023-05-19 17:14	234.0
224				2023-05-19 17:15	234.0
225				2023-05-19 17:16	233.9
226				2023-05-19 17:17	233.6
227				2023-05-19 17:18	233.0

228				2023-05-19 17:19	232.4
229				2023-05-19 17:20	232.1
230				2023-05-19 17:21	231.4
231				2023-05-19 17:22	231.2
232				2023-05-19 17:23	230.5
233				2023-05-19 17:24	230.2
234				2023-05-19 17:25	230.0
235				2023-05-19 17:26	230.0
236				2023-05-19 17:27	229.7
237				2023-05-19 17:28	229.1
238				2023-05-19 17:29	228.8
239				2023-05-19 17:30	228.3
240				2023-05-19 17:31	228.2
241				2023-05-19 17:32	227.1
242				2023-05-19 17:33	226.8
243				2023-05-19 17:34	226.3
244				2023-05-19 17:35	225.4
245				2023-05-19 17:36	224.7
246				2023-05-19 17:37	224.6
247				2023-05-19 17:38	223.9
248				2023-05-19 17:39	223.2
249				2023-05-19 17:40	222.5
250				2023-05-19 17:41	222.6
251				2023-05-19 17:42	221.9
252				2023-05-19 17:43	221.3
253				2023-05-19 17:44	220.4
254				2023-05-19 17:45	219.9
255				2023-05-19 17:46	219.5
256				2023-05-19 17:47	218.9
257				2023-05-19 17:48	218.2
258				2023-05-19 17:49	217.8
259				2023-05-19 17:50	216.9
260				2023-05-19 17:51	216.8
261				2023-05-19 17:52	216.1
262				2023-05-19 17:53	215.4
263				2023-05-19 17:54	215.1
264				2023-05-19 17:55	214.9
265				2023-05-19 17:56	214.0
266				2023-05-19 17:57	213.4
267				2023-05-19 17:58	212.8
268				2023-05-19 17:59	212.5
269				2023-05-19 18:00	212.1
270				2023-05-19 18:01	211.6
271				2023-05-19 18:02	211.7
272				2023-05-19 18:03	211.1
273				2023-05-19 18:04	210.6
274				2023-05-19 18:05	210.1
275				2023-05-19 18:06	209.4
276				2023-05-19 18:07	209.0
277				2023-05-19 18:08	208.6
278				2023-05-19 18:09	208.6
279				2023-05-19 18:10	208.1
280				2023-05-19 18:11	207.7
281				2023-05-19 18:12	207.0
282				2023-05-19 18:13	206.4
283				2023-05-19 18:14	206.1
284				2023-05-19 18:15	205.9
285				2023-05-19 18:16	205.8
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287				2023-05-19 18:18	205.2
288				2023-05-19 18:19	204.5
289				2023-05-19 18:20	203.9
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291				2023-05-19 18:22	203.3
292				2023-05-19 18:23	203.2
293				2023-05-19 18:24	202.9
294				2023-05-19 18:25	202.2
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298				2023-05-19 18:29	200.7
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303				2023-05-19 18:34	198.9
304				2023-05-19 18:35	198.6
305				2023-05-19 18:36	197.9
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307				2023-05-19 18:38	197.3



308				2023-05-19 18:39	196.9
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310				2023-05-19 18:41	196.7
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312				2023-05-19 18:43	196.3
313				2023-05-19 18:44	195.9
314				2023-05-19 18:45	195.7
315				2023-05-19 18:46	195.3
316				2023-05-19 18:47	195.0
317				2023-05-19 18:48	194.4
318				2023-05-19 18:49	194.1
319				2023-05-19 18:50	194.1
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321				2023-05-19 18:52	193.2
322				2023-05-19 18:53	193.0
323				2023-05-19 18:54	192.8
324				2023-05-19 18:55	193.1
325				2023-05-19 18:56	192.6
326				2023-05-19 18:57	192.7
327				2023-05-19 18:58	192.3
328				2023-05-19 18:59	192.0
329				2023-05-19 19:00	191.7
330				2023-05-19 19:01	191.5
331				2023-05-19 19:02	191.5
332				2023-05-19 19:03	191.4
333				2023-05-19 19:04	191.1
334				2023-05-19 19:05	191.0
335				2023-05-19 19:06	190.7
336				2023-05-19 19:07	190.4
337				2023-05-19 19:08	190.7
338				2023-05-19 19:09	190.2
339				2023-05-19 19:10	190.3
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341				2023-05-19 19:12	189.9
342				2023-05-19 19:13	189.9
343				2023-05-19 19:14	189.4
344				2023-05-19 19:15	189.2
345				2023-05-19 19:16	188.9
346				2023-05-19 19:17	189.0
347				2023-05-19 19:18	188.7
348				2023-05-19 19:19	188.4
349				2023-05-19 19:20	188.0
350				2023-05-19 19:21	188.5
351				2023-05-19 19:22	188.6
352				2023-05-19 19:23	188.8
353				2023-05-19 19:24	188.6
354				2023-05-19 19:25	188.4
355				2023-05-19 19:26	188.1
356				2023-05-19 19:27	187.7
357				2023-05-19 19:28	187.4
358				2023-05-19 19:29	187.2
359				2023-05-19 19:30	186.8
360				2023-05-19 19:31	186.7
361				2023-05-19 19:32	186.5
362				2023-05-19 19:33	186.2
363				2023-05-19 19:34	185.7
364				2023-05-19 19:35	185.3
365				2023-05-19 19:36	185.1
366				2023-05-19 19:37	185.0
367				2023-05-19 19:38	184.5
368				2023-05-19 19:39	184.5
369				2023-05-19 19:40	184.2
370				2023-05-19 19:41	183.7
371				2023-05-19 19:42	183.6
372				2023-05-19 19:43	183.4
373				2023-05-19 19:44	183.4
374				2023-05-19 19:45	182.8
375				2023-05-19 19:46	182.7
376				2023-05-19 19:47	182.5
377				2023-05-19 19:48	182.2
378				2023-05-19 19:49	182.1
379				2023-05-19 19:50	182.1
380				2023-05-19 19:51	182.3
381				2023-05-19 19:52	182.0
382				2023-05-19 19:53	181.7
383				2023-05-19 19:54	181.7
384				2023-05-19 19:55	181.5
385				2023-05-19 19:56	181.2
386				2023-05-19 19:57	180.8
387				2023-05-19 19:58	180.8

388					2023-05-19 19:59	180.8
389					2023-05-19 20:00	180.9
390					2023-05-19 20:01	180.7
391					2023-05-19 20:02	180.8

1.7R Series Pre-burn Data

2023-05-24

Total time (h)

10.42

Wood Specie: Beech								
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)	(-)	(in.)		(min)	(°F)
2023-05-24 11:03	Kindling & SUF	7.33	14.5	18	16.0	Pre-Charge (min)	35	522.0
2023-05-24 11:39	High fire	14.90	19.3	5	16.0	Conditioning (min)	81	619.0
2023-05-24 13:01	Low fire	17.56	19.5	5	16.0	Load (min)	509	263.3

	Average Tflue (°F)	522.0		619.0		263.3
	Pre-Charge (min)	35	Conditioning (min)	81	Load (min)	509
Air control position	Full open		Full open		Fully closed (or mid point)	
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)
0	2023-05-24 11:03	74.0	2023-05-24 11:39	510.1	2023-05-24 13:01	429.0
1	2023-05-24 11:04	118.9	2023-05-24 11:40	473.8	2023-05-24 13:02	387.3
2	2023-05-24 11:05	165.5	2023-05-24 11:41	508.7	2023-05-24 13:03	408.4
3	2023-05-24 11:06	205.1	2023-05-24 11:42	534.3	2023-05-24 13:04	524.7
4	2023-05-24 11:07	298.1	2023-05-24 11:43	540.1	2023-05-24 13:05	582.6
5	2023-05-24 11:08	373.2	2023-05-24 11:44	550.3	2023-05-24 13:06	578.1
6	2023-05-24 11:09	402.1	2023-05-24 11:45	555.4	2023-05-24 13:07	573.9
7	2023-05-24 11:10	451.0	2023-05-24 11:46	550.0	2023-05-24 13:08	572.0
8	2023-05-24 11:11	499.9	2023-05-24 11:47	542.3	2023-05-24 13:09	574.2
9	2023-05-24 11:12	531.0	2023-05-24 11:48	533.1	2023-05-24 13:10	561.9
10	2023-05-24 11:13	561.5	2023-05-24 11:49	522.7	2023-05-24 13:11	556.1
11	2023-05-24 11:14	586.1	2023-05-24 11:50	514.5	2023-05-24 13:12	544.2
12	2023-05-24 11:15	587.9	2023-05-24 11:51	508.9	2023-05-24 13:13	531.1
13	2023-05-24 11:16	598.6	2023-05-24 11:52	503.8	2023-05-24 13:14	526.2
14	2023-05-24 11:17	598.3	2023-05-24 11:53	494.1	2023-05-24 13:15	502.4
15	2023-05-24 11:18	599.7	2023-05-24 11:54	477.4	2023-05-24 13:16	479.4
16	2023-05-24 11:19	597.3	2023-05-24 11:55	464.2	2023-05-24 13:17	459.6
17	2023-05-24 11:20	588.3	2023-05-24 11:56	456.6	2023-05-24 13:18	444.1
18	2023-05-24 11:21	598.3	2023-05-24 11:57	450.4	2023-05-24 13:19	432.1
19	2023-05-24 11:22	612.8	2023-05-24 11:58	444.5	2023-05-24 13:20	422.2
20	2023-05-24 11:23	613.8	2023-05-24 11:59	439.7	2023-05-24 13:21	418.2
21	2023-05-24 11:24	605.1	2023-05-24 12:00	440.2	2023-05-24 13:22	421.5
22	2023-05-24 11:25	615.2	2023-05-24 12:01	448.9	2023-05-24 13:23	430.9
23	2023-05-24 11:26	626.1	2023-05-24 12:02	453.8	2023-05-24 13:24	441.0
24	2023-05-24 11:27	632.6	2023-05-24 12:03	460.7	2023-05-24 13:25	450.4
25	2023-05-24 11:28	638.0	2023-05-24 12:04	470.8	2023-05-24 13:26	456.1
26	2023-05-24 11:29	639.6	2023-05-24 12:05	486.1	2023-05-24 13:27	457.8
27	2023-05-24 11:30	645.1	2023-05-24 12:06	513.6	2023-05-24 13:28	457.3
28	2023-05-24 11:31	652.3	2023-05-24 12:07	539.3	2023-05-24 13:29	456.5
29	2023-05-24 11:32	625.8	2023-05-24 12:08	560.4	2023-05-24 13:30	455.5
30	2023-05-24 11:33	607.0	2023-05-24 12:09	574.5	2023-05-24 13:31	456.3
31	2023-05-24 11:34	593.7	2023-05-24 12:10	580.8	2023-05-24 13:32	455.8
32	2023-05-24 11:35	582.2	2023-05-24 12:11	586.6	2023-05-24 13:33	454.7
33	2023-05-24 11:36	567.9	2023-05-24 12:12	593.8	2023-05-24 13:34	456.1
34	2023-05-24 11:37	555.1	2023-05-24 12:13	602.3	2023-05-24 13:35	456.8
35	2023-05-24 11:38	545.1	2023-05-24 12:14	608.1	2023-05-24 13:36	456.3
36			2023-05-24 12:15	613.1	2023-05-24 13:37	453.6
37			2023-05-24 12:16	627.2	2023-05-24 13:38	453.3
38			2023-05-24 12:17	635.2	2023-05-24 13:39	455.2
39			2023-05-24 12:18	643.2	2023-05-24 13:40	453.6
40			2023-05-24 12:19	651.3	2023-05-24 13:41	453.9
41			2023-05-24 12:20	658.0	2023-05-24 13:42	455.0
42			2023-05-24 12:21	669.0	2023-05-24 13:43	456.2
43			2023-05-24 12:22	689.5	2023-05-24 13:44	456.2
44			2023-05-24 12:23	710.4	2023-05-24 13:45	454.5
45			2023-05-24 12:24	721.6	2023-05-24 13:46	453.3
46			2023-05-24 12:25	729.7	2023-05-24 13:47	452.5
47			2023-05-24 12:26	744.9	2023-05-24 13:48	453.4
48			2023-05-24 12:27	758.5	2023-05-24 13:49	455.8
49			2023-05-24 12:28	764.5	2023-05-24 13:50	460.0
50			2023-05-24 12:29	774.4	2023-05-24 13:51	462.2
51			2023-05-24 12:30	791.3	2023-05-24 13:52	462.7
52			2023-05-24 12:31	793.2	2023-05-24 13:53	464.3
53			2023-05-24 12:32	792.5	2023-05-24 13:54	468.1
54			2023-05-24 12:33	794.6	2023-05-24 13:55	473.1
55			2023-05-24 12:34	776.8	2023-05-24 13:56	475.1
56			2023-05-24 12:35	773.8	2023-05-24 13:57	471.9
57			2023-05-24 12:36	776.2	2023-05-24 13:58	466.7
58			2023-05-24 12:37	778.6	2023-05-24 13:59	462.7
59			2023-05-24 12:38	781.0	2023-05-24 14:00	459.6
60			2023-05-24 12:39	780.6	2023-05-24 14:01	457.0
61			2023-05-24 12:40	788.3	2023-05-24 14:02	456.7
62			2023-05-24 12:41	780.0	2023-05-24 14:03	457.4
63			2023-05-24 12:42	772.2	2023-05-24 14:04	458.8
64			2023-05-24 12:43	767.9	2023-05-24 14:05	456.4
65			2023-05-24 12:44	756.9	2023-05-24 14:06	453.9
66			2023-05-24 12:45	746.8	2023-05-24 14:07	448.9
67			2023-05-24 12:46	740.8	2023-05-24 14:08	447.3

68		2023-05-24 12:47	727.7	2023-05-24 14:09	447.1
69		2023-05-24 12:48	710.5	2023-05-24 14:10	448.2
70		2023-05-24 12:49	693.4	2023-05-24 14:11	450.2
71		2023-05-24 12:50	675.9	2023-05-24 14:12	451.3
72		2023-05-24 12:51	662.7	2023-05-24 14:13	452.5
73		2023-05-24 12:52	648.5	2023-05-24 14:14	453.9
74		2023-05-24 12:53	630.5	2023-05-24 14:15	454.6
75		2023-05-24 12:54	609.9	2023-05-24 14:16	456.8
76		2023-05-24 12:55	589.4	2023-05-24 14:17	461.1
77		2023-05-24 12:56	570.2	2023-05-24 14:18	463.0
78		2023-05-24 12:57	553.3	2023-05-24 14:19	456.3
79		2023-05-24 12:58	541.2	2023-05-24 14:20	448.0
80		2023-05-24 12:58	540.3	2023-05-24 14:21	442.2
81		2023-05-24 13:00	529.2	2023-05-24 14:22	438.8
82				2023-05-24 14:23	437.1
83				2023-05-24 14:24	437.3
84				2023-05-24 14:25	438.3
85				2023-05-24 14:26	439.7
86				2023-05-24 14:27	442.3
87				2023-05-24 14:28	446.2
88				2023-05-24 14:29	447.0
89				2023-05-24 14:30	447.2
90				2023-05-24 14:31	446.3
91				2023-05-24 14:32	446.1
92				2023-05-24 14:33	446.7
93				2023-05-24 14:34	447.9
94				2023-05-24 14:35	449.1
95				2023-05-24 14:36	450.7
96				2023-05-24 14:37	453.3
97				2023-05-24 14:38	456.4
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109				2023-05-24 14:50	437.5
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112				2023-05-24 14:53	435.7
113				2023-05-24 14:54	435.2
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115				2023-05-24 14:56	433.7
116				2023-05-24 14:57	429.7
117				2023-05-24 14:58	423.9
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122				2023-05-24 15:03	387.3
123				2023-05-24 15:04	382.0
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133				2023-05-24 15:14	359.9
134				2023-05-24 15:15	358.3
135				2023-05-24 15:16	353.4
136				2023-05-24 15:17	349.6
137				2023-05-24 15:18	344.2
138				2023-05-24 15:19	336.0
139				2023-05-24 15:20	327.0
140				2023-05-24 15:21	320.4
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142				2023-05-24 15:23	311.0
143				2023-05-24 15:24	306.9
144				2023-05-24 15:25	303.6
145				2023-05-24 15:26	300.0
146				2023-05-24 15:27	296.8
147				2023-05-24 15:28	293.9

148				2023-05-24 15:29	291.2
149				2023-05-24 15:30	288.4
150				2023-05-24 15:31	285.8
151				2023-05-24 15:32	283.3
152				2023-05-24 15:33	281.2
153				2023-05-24 15:34	279.0
154				2023-05-24 15:35	276.7
155				2023-05-24 15:36	274.4
156				2023-05-24 15:37	272.0
157				2023-05-24 15:38	270.3
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161				2023-05-24 15:42	263.0
162				2023-05-24 15:43	261.1
163				2023-05-24 15:44	259.5
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172				2023-05-24 15:53	247.8
173				2023-05-24 15:54	246.8
174				2023-05-24 15:55	246.0
175				2023-05-24 15:56	245.1
176				2023-05-24 15:57	244.1
177				2023-05-24 15:58	242.7
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179				2023-05-24 16:00	241.0
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181				2023-05-24 16:02	239.3
182				2023-05-24 16:03	237.7
183				2023-05-24 16:04	236.1
184				2023-05-24 16:05	235.5
185				2023-05-24 16:06	234.3
186				2023-05-24 16:07	233.4
187				2023-05-24 16:08	232.6
188				2023-05-24 16:09	231.4
189				2023-05-24 16:10	230.6
190				2023-05-24 16:11	229.7
191				2023-05-24 16:12	228.6
192				2023-05-24 16:13	228.0
193				2023-05-24 16:14	227.0
194				2023-05-24 16:15	226.4
195				2023-05-24 16:16	225.7
196				2023-05-24 16:17	225.0
197				2023-05-24 16:18	223.9
198				2023-05-24 16:19	223.4
199				2023-05-24 16:20	222.9
200				2023-05-24 16:21	222.2
201				2023-05-24 16:22	221.4
202				2023-05-24 16:23	220.7
203				2023-05-24 16:24	220.0
204				2023-05-24 16:25	219.4
205				2023-05-24 16:26	218.5
206				2023-05-24 16:27	217.8
207				2023-05-24 16:28	217.2
208				2023-05-24 16:29	217.0
209				2023-05-24 16:30	216.4
210				2023-05-24 16:31	215.4
211				2023-05-24 16:32	215.2
212				2023-05-24 16:33	214.4
213				2023-05-24 16:34	214.1
214				2023-05-24 16:35	213.4
215				2023-05-24 16:36	213.0
216				2023-05-24 16:37	212.5
217				2023-05-24 16:38	212.1
218				2023-05-24 16:39	211.7
219				2023-05-24 16:40	211.1
220				2023-05-24 16:41	210.7
221				2023-05-24 16:42	210.4
222				2023-05-24 16:43	209.5
223				2023-05-24 16:44	209.2
224				2023-05-24 16:45	209.4
225				2023-05-24 16:46	209.2
226				2023-05-24 16:47	209.0
227				2023-05-24 16:48	209.2

228				2023-05-24 16:49	208.6
229				2023-05-24 16:50	208.3
230				2023-05-24 16:51	208.0
231				2023-05-24 16:52	207.8
232				2023-05-24 16:53	207.6
233				2023-05-24 16:54	207.1
234				2023-05-24 16:55	206.8
235				2023-05-24 16:56	206.4
236				2023-05-24 16:57	206.2
237				2023-05-24 16:58	205.6
238				2023-05-24 16:59	204.9
239				2023-05-24 17:00	204.5
240				2023-05-24 17:01	204.0
241				2023-05-24 17:02	203.6
242				2023-05-24 17:03	203.5
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244				2023-05-24 17:05	202.8
245				2023-05-24 17:06	202.3
246				2023-05-24 17:07	202.0
247				2023-05-24 17:08	201.7
248				2023-05-24 17:09	201.1
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256				2023-05-24 17:17	198.1
257				2023-05-24 17:18	197.7
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270				2023-05-24 17:31	193.2
271				2023-05-24 17:32	193.0
272				2023-05-24 17:33	192.4
273				2023-05-24 17:34	192.2
274				2023-05-24 17:35	192.2
275				2023-05-24 17:36	192.0
276				2023-05-24 17:37	191.9
277				2023-05-24 17:38	191.7
278				2023-05-24 17:39	191.4
279				2023-05-24 17:40	191.3
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282				2023-05-24 17:43	191.0
283				2023-05-24 17:44	190.8
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293				2023-05-24 17:54	188.2
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297				2023-05-24 17:58	187.0
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300				2023-05-24 18:01	185.9
301				2023-05-24 18:02	185.6
302				2023-05-24 18:03	185.4
303				2023-05-24 18:04	185.2
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306				2023-05-24 18:07	183.7
307				2023-05-24 18:08	183.5

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309				2023-05-24 18:10	182.8
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312				2023-05-24 18:13	182.0
313				2023-05-24 18:14	181.8
314				2023-05-24 18:15	181.4
315				2023-05-24 18:16	181.0
316				2023-05-24 18:17	180.8
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318				2023-05-24 18:19	180.7
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326				2023-05-24 18:27	179.2
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328				2023-05-24 18:29	178.8
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331				2023-05-24 18:32	178.3
332				2023-05-24 18:33	177.9
333				2023-05-24 18:34	177.9
334				2023-05-24 18:35	177.4
335				2023-05-24 18:36	177.3
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344				2023-05-24 18:45	176.0
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352				2023-05-24 18:53	174.4
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357				2023-05-24 18:58	173.6
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362				2023-05-24 19:03	173.0
363				2023-05-24 19:04	172.8
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390				2023-05-24 19:31	170.5
391				2023-05-24 19:32	170.3
392				2023-05-24 19:33	170.3
393				2023-05-24 19:34	170.1
394				2023-05-24 19:35	170.1
395				2023-05-24 19:36	170.1
396				2023-05-24 19:37	170.0
397				2023-05-24 19:38	170.3
398				2023-05-24 19:39	170.1
399				2023-05-24 19:40	170.0
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401				2023-05-24 19:42	170.0
402				2023-05-24 19:43	169.9
403				2023-05-24 19:44	169.7
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411				2023-05-24 19:52	170.2
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413				2023-05-24 19:54	170.5
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415				2023-05-24 19:56	170.5
416				2023-05-24 19:57	170.9
417				2023-05-24 19:58	171.0
418				2023-05-24 19:59	171.3
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422				2023-05-24 20:03	171.9
423				2023-05-24 20:04	171.9
424				2023-05-24 20:05	172.2
425				2023-05-24 20:06	172.4
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452				2023-05-24 20:33	173.0
453				2023-05-24 20:34	172.8
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455				2023-05-24 20:36	172.4
456				2023-05-24 20:37	172.4
457				2023-05-24 20:38	172.1
458				2023-05-24 20:39	172.3
459				2023-05-24 20:40	172.5
460				2023-05-24 20:41	172.3
461				2023-05-24 20:42	172.2
462				2023-05-24 20:43	171.9
463				2023-05-24 20:44	172.0
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465				2023-05-24 20:46	171.7
466				2023-05-24 20:47	171.8
467				2023-05-24 20:48	171.7



468					2023-05-24 20:49	171.4
469					2023-05-24 20:50	171.2
470					2023-05-24 20:51	171.3
471					2023-05-24 20:52	171.4
472					2023-05-24 20:53	171.2
473					2023-05-24 20:54	170.9
474					2023-05-24 20:55	170.7
475					2023-05-24 20:56	170.4
476					2023-05-24 20:57	170.3
477					2023-05-24 20:58	170.1
478					2023-05-24 20:59	170.0
479					2023-05-24 21:00	170.1
480					2023-05-24 21:01	169.5
481					2023-05-24 21:02	169.5
482					2023-05-24 21:03	169.1
483					2023-05-24 21:04	169.0
484					2023-05-24 21:05	169.0
485					2023-05-24 21:06	168.7
486					2023-05-24 21:07	168.6
487					2023-05-24 21:08	168.3
488					2023-05-24 21:09	168.1
489					2023-05-24 21:10	167.8
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491					2023-05-24 21:12	167.6
492					2023-05-24 21:13	167.2
493					2023-05-24 21:14	167.1
494					2023-05-24 21:15	167.0
495					2023-05-24 21:16	166.5
496					2023-05-24 21:17	166.4
497					2023-05-24 21:18	166.2
498					2023-05-24 21:19	166.1
499					2023-05-24 21:20	166.1
500					2023-05-24 21:21	166.2
501					2023-05-24 21:22	165.8
502					2023-05-24 21:23	165.9
503					2023-05-24 21:24	165.7
504					2023-05-24 21:25	165.7
505					2023-05-24 21:26	165.4
506					2023-05-24 21:27	165.2
507					2023-05-24 21:28	165.3
508					2023-05-24 21:29	165.0
509					2023-05-24 21:30	165.2

1.7R Series Pre-burn Data

2023-05-25

Total time (h)

9.82

Wood Specie: Beech								
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)	(-)	(in.)		(min)	(°F)
2023-05-25 10:05	Kindling & SUF	7.14	14.9	18	16.0	Pre-Charge (min)	34	487.0
2023-05-25 10:40	High fire	14.51	20.8	5	16.0	Conditioning (min)	120	499.6
2023-05-25 12:42	Low fire	17.40	19.4	5	16.0	Load (min)	435	281.8

		Average Tflue (°F)	487.0			499.6			281.8
		Pre-Charge (min)	34			Conditioning (min)	120		
		Full open		Full open		Fully closed (or mid point)		435	
Air control position	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)			
0	2023-05-25 10:05	75.9	2023-05-25 10:40	497.4	2023-05-25 12:42	393.2			
1	2023-05-25 10:06	130.3	2023-05-25 10:41	425.1	2023-05-25 12:43	420.7			
2	2023-05-25 10:07	169.1	2023-05-25 10:42	442.2	2023-05-25 12:44	506.4			
3	2023-05-25 10:08	209.8	2023-05-25 10:43	502.7	2023-05-25 12:45	571.5			
4	2023-05-25 10:09	266.8	2023-05-25 10:44	507.1	2023-05-25 12:46	574.6			
5	2023-05-25 10:10	314.4	2023-05-25 10:45	499.7	2023-05-25 12:47	577.8			
6	2023-05-25 10:11	379.2	2023-05-25 10:46	502.4	2023-05-25 12:48	588.3			
7	2023-05-25 10:12	455.4	2023-05-25 10:47	500.0	2023-05-25 12:49	584.6			
8	2023-05-25 10:13	473.6	2023-05-25 10:48	486.0	2023-05-25 12:50	568.6			
9	2023-05-25 10:14	494.0	2023-05-25 10:49	467.4	2023-05-25 12:51	550.1			
10	2023-05-25 10:15	509.0	2023-05-25 10:50	465.3	2023-05-25 12:52	526.3			
11	2023-05-25 10:16	502.8	2023-05-25 10:51	456.4	2023-05-25 12:53	502.8			
12	2023-05-25 10:17	503.0	2023-05-25 10:52	444.6	2023-05-25 12:54	475.9			
13	2023-05-25 10:18	515.4	2023-05-25 10:53	436.1	2023-05-25 12:55	450.4			
14	2023-05-25 10:19	523.2	2023-05-25 10:54	425.6	2023-05-25 12:56	428.2			
15	2023-05-25 10:20	538.9	2023-05-25 10:55	406.3	2023-05-25 12:57	412.7			
16	2023-05-25 10:21	529.2	2023-05-25 10:56	371.0	2023-05-25 12:58	406.6			
17	2023-05-25 10:22	513.3	2023-05-25 10:57	356.4	2023-05-25 12:59	407.0			
18	2023-05-25 10:23	521.4	2023-05-25 10:58	402.9	2023-05-25 13:00	408.1			
19	2023-05-25 10:24	531.7	2023-05-25 10:59	417.6	2023-05-25 13:01	406.9			
20	2023-05-25 10:25	559.7	2023-05-25 11:00	432.6	2023-05-25 13:02	398.0			
21	2023-05-25 10:26	583.2	2023-05-25 11:01	444.3	2023-05-25 13:03	419.7			
22	2023-05-25 10:27	601.7	2023-05-25 11:02	460.9	2023-05-25 13:04	429.8			
23	2023-05-25 10:28	607.4	2023-05-25 11:03	493.8	2023-05-25 13:05	434.4			
24	2023-05-25 10:29	611.9	2023-05-25 11:04	527.5	2023-05-25 13:06	436.8			
25	2023-05-25 10:30	611.0	2023-05-25 11:05	548.4	2023-05-25 13:07	438.7			
26	2023-05-25 10:31	616.9	2023-05-25 11:06	557.6	2023-05-25 13:08	439.8			
27	2023-05-25 10:32	619.6	2023-05-25 11:07	566.1	2023-05-25 13:09	441.5			
28	2023-05-25 10:33	618.3	2023-05-25 11:08	574.3	2023-05-25 13:10	442.8			
29	2023-05-25 10:34	616.4	2023-05-25 11:09	582.0	2023-05-25 13:11	443.8			
30	2023-05-25 10:35	608.7	2023-05-25 11:10	588.6	2023-05-25 13:12	443.4			
31	2023-05-25 10:36	593.7	2023-05-25 11:11	594.6	2023-05-25 13:13	443.5			
32	2023-05-25 10:37	565.1	2023-05-25 11:12	594.9	2023-05-25 13:14	445.5			
33	2023-05-25 10:38	544.3	2023-05-25 11:13	597.9	2023-05-25 13:15	447.6			
34	2023-05-25 10:39	529.9	2023-05-25 11:14	602.5	2023-05-25 13:16	450.5			
35			2023-05-25 11:15	606.1	2023-05-25 13:17	452.5			
36			2023-05-25 11:16	613.3	2023-05-25 13:18	454.4			
37			2023-05-25 11:17	617.6	2023-05-25 13:19	456.1			
38			2023-05-25 11:18	620.2	2023-05-25 13:20	459.3			
39			2023-05-25 11:19	623.3	2023-05-25 13:21	462.0			
40			2023-05-25 11:20	627.3	2023-05-25 13:22	463.7			
41			2023-05-25 11:21	631.3	2023-05-25 13:23	478.1			
42			2023-05-25 11:22	635.8	2023-05-25 13:24	497.0			
43			2023-05-25 11:23	637.4	2023-05-25 13:25	515.4			
44			2023-05-25 11:24	637.8	2023-05-25 13:26	524.4			
45			2023-05-25 11:25	638.6	2023-05-25 13:27	530.1			
46			2023-05-25 11:26	632.3	2023-05-25 13:28	535.1			
47			2023-05-25 11:27	626.8	2023-05-25 13:29	539.7			
48			2023-05-25 11:28	619.1	2023-05-25 13:30	542.5			
49			2023-05-25 11:29	611.3	2023-05-25 13:31	544.9			
50			2023-05-25 11:30	602.2	2023-05-25 13:32	547.3			
51			2023-05-25 11:31	594.0	2023-05-25 13:33	550.0			
52			2023-05-25 11:32	587.6	2023-05-25 13:34	552.1			
53			2023-05-25 11:33	581.4	2023-05-25 13:35	554.3			
54			2023-05-25 11:34	572.9	2023-05-25 13:36	556.6			
55			2023-05-25 11:35	569.1	2023-05-25 13:37	559.2			
56			2023-05-25 11:36	563.3	2023-05-25 13:38	561.8			
57			2023-05-25 11:37	556.8	2023-05-25 13:39	563.3			
58			2023-05-25 11:38	549.2	2023-05-25 13:40	563.9			
59			2023-05-25 11:39	539.4	2023-05-25 13:41	563.3			
60			2023-05-25 11:40	532.5	2023-05-25 13:42	562.8			
61			2023-05-25 11:41	524.7	2023-05-25 13:43	565.4			
62			2023-05-25 11:42	518.9	2023-05-25 13:44	563.4			
63			2023-05-25 11:43	512.0	2023-05-25 13:45	552.9			
64			2023-05-25 11:44	505.3	2023-05-25 13:46	544.0			
65			2023-05-25 11:45	499.5	2023-05-25 13:47	537.7			
66			2023-05-25 11:46	493.6	2023-05-25 13:48	534.7			
67			2023-05-25 11:47	489.8	2023-05-25 13:49	532.7			

68		2023-05-25 11:48	486.8	2023-05-25 13:50	529.9
69		2023-05-25 11:49	481.6	2023-05-25 13:51	526.4
70		2023-05-25 11:50	478.3	2023-05-25 13:52	521.1
71		2023-05-25 11:51	475.5	2023-05-25 13:53	517.4
72		2023-05-25 11:52	472.9	2023-05-25 13:54	515.5
73		2023-05-25 11:53	471.8	2023-05-25 13:55	512.0
74		2023-05-25 11:54	470.4	2023-05-25 13:56	507.6
75		2023-05-25 11:55	469.1	2023-05-25 13:57	502.5
76		2023-05-25 11:56	469.0	2023-05-25 13:58	498.0
77		2023-05-25 11:57	469.2	2023-05-25 13:59	495.4
78		2023-05-25 11:58	469.1	2023-05-25 14:00	490.1
79		2023-05-25 11:59	468.9	2023-05-25 14:01	487.3
80		2023-05-25 12:00	467.6	2023-05-25 14:02	483.9
81		2023-05-25 12:01	468.1	2023-05-25 14:03	481.2
82		2023-05-25 12:02	468.5	2023-05-25 14:04	473.7
83		2023-05-25 12:03	469.5	2023-05-25 14:05	465.7
84		2023-05-25 12:04	472.3	2023-05-25 14:06	459.9
85		2023-05-25 12:05	473.3	2023-05-25 14:07	460.2
86		2023-05-25 12:06	473.2	2023-05-25 14:08	459.7
87		2023-05-25 12:07	475.8	2023-05-25 14:09	456.5
88		2023-05-25 12:08	476.7	2023-05-25 14:10	451.1
89		2023-05-25 12:09	475.7	2023-05-25 14:11	445.3
90		2023-05-25 12:10	473.2	2023-05-25 14:12	442.9
91		2023-05-25 12:11	471.7	2023-05-25 14:13	438.9
92		2023-05-25 12:12	469.8	2023-05-25 14:14	432.6
93		2023-05-25 12:13	468.4	2023-05-25 14:15	427.7
94		2023-05-25 12:14	466.7	2023-05-25 14:16	424.2
95		2023-05-25 12:15	465.3	2023-05-25 14:17	420.9
96		2023-05-25 12:16	461.9	2023-05-25 14:18	417.5
97		2023-05-25 12:17	460.6	2023-05-25 14:19	413.8
98		2023-05-25 12:18	454.7	2023-05-25 14:20	409.8
99		2023-05-25 12:19	448.8	2023-05-25 14:21	405.6
100		2023-05-25 12:20	445.7	2023-05-25 14:22	401.3
101		2023-05-25 12:21	441.6	2023-05-25 14:23	396.5
102		2023-05-25 12:22	437.2	2023-05-25 14:24	390.9
103		2023-05-25 12:23	434.3	2023-05-25 14:25	386.5
104		2023-05-25 12:24	433.1	2023-05-25 14:26	381.8
105		2023-05-25 12:25	432.3	2023-05-25 14:27	375.9
106		2023-05-25 12:26	431.5	2023-05-25 14:28	368.1
107		2023-05-25 12:27	432.6	2023-05-25 14:29	360.7
108		2023-05-25 12:28	434.1	2023-05-25 14:30	353.2
109		2023-05-25 12:29	434.2	2023-05-25 14:31	347.7
110		2023-05-25 12:30	434.0	2023-05-25 14:32	340.3
111		2023-05-25 12:31	433.5	2023-05-25 14:33	332.1
112		2023-05-25 12:32	432.8	2023-05-25 14:34	326.6
113		2023-05-25 12:33	430.5	2023-05-25 14:35	325.0
114		2023-05-25 12:34	426.7	2023-05-25 14:36	323.1
115		2023-05-25 12:35	421.7	2023-05-25 14:37	318.0
116		2023-05-25 12:36	415.2	2023-05-25 14:38	315.3
117		2023-05-25 12:37	409.7	2023-05-25 14:39	313.6
118		2023-05-25 12:38	404.5	2023-05-25 14:40	309.7
119		2023-05-25 12:38	403.9	2023-05-25 14:41	306.7
120		2023-05-25 12:41	490.8	2023-05-25 14:42	304.4
121				2023-05-25 14:43	301.6
122				2023-05-25 14:44	298.5
123				2023-05-25 14:45	295.4
124				2023-05-25 14:46	292.8
125				2023-05-25 14:47	291.1
126				2023-05-25 14:48	289.5
127				2023-05-25 14:49	288.4
128				2023-05-25 14:50	287.0
129				2023-05-25 14:51	286.0
130				2023-05-25 14:52	284.0
131				2023-05-25 14:53	282.5
132				2023-05-25 14:54	281.4
133				2023-05-25 14:55	280.2
134				2023-05-25 14:56	278.7
135				2023-05-25 14:57	277.6
136				2023-05-25 14:58	276.7
137				2023-05-25 14:59	275.5
138				2023-05-25 15:00	274.3
139				2023-05-25 15:01	273.5
140				2023-05-25 15:02	271.9
141				2023-05-25 15:03	270.6
142				2023-05-25 15:04	269.4
143				2023-05-25 15:05	268.8
144				2023-05-25 15:06	267.6
145				2023-05-25 15:07	266.7
146				2023-05-25 15:08	265.8
147				2023-05-25 15:09	265.2

148				2023-05-25 15:10	264.1
149				2023-05-25 15:11	263.5
150				2023-05-25 15:12	262.9
151				2023-05-25 15:13	261.9
152				2023-05-25 15:14	260.9
153				2023-05-25 15:15	259.8
154				2023-05-25 15:16	258.9
155				2023-05-25 15:17	258.4
156				2023-05-25 15:18	257.5
157				2023-05-25 15:19	256.5
158				2023-05-25 15:20	256.4
159				2023-05-25 15:21	255.9
160				2023-05-25 15:22	255.5
161				2023-05-25 15:23	254.6
162				2023-05-25 15:24	254.3
163				2023-05-25 15:25	253.4
164				2023-05-25 15:26	252.4
165				2023-05-25 15:27	252.2
166				2023-05-25 15:28	251.2
167				2023-05-25 15:29	250.2
168				2023-05-25 15:30	250.0
169				2023-05-25 15:31	249.9
170				2023-05-25 15:32	249.5
171				2023-05-25 15:33	248.6
172				2023-05-25 15:34	247.8
173				2023-05-25 15:35	247.3
174				2023-05-25 15:36	246.7
175				2023-05-25 15:37	246.0
176				2023-05-25 15:38	245.5
177				2023-05-25 15:39	244.8
178				2023-05-25 15:40	244.3
179				2023-05-25 15:41	243.7
180				2023-05-25 15:42	243.2
181				2023-05-25 15:43	243.1
182				2023-05-25 15:44	242.3
183				2023-05-25 15:45	241.5
184				2023-05-25 15:46	241.3
185				2023-05-25 15:47	240.5
186				2023-05-25 15:48	240.0
187				2023-05-25 15:49	239.3
188				2023-05-25 15:50	238.7
189				2023-05-25 15:51	238.3
190				2023-05-25 15:52	238.1
191				2023-05-25 15:53	237.4
192				2023-05-25 15:54	237.1
193				2023-05-25 15:55	236.4
194				2023-05-25 15:56	235.9
195				2023-05-25 15:57	235.4
196				2023-05-25 15:58	235.4
197				2023-05-25 15:59	235.0
198				2023-05-25 16:00	234.4
199				2023-05-25 16:01	234.1
200				2023-05-25 16:02	233.9
201				2023-05-25 16:03	233.5
202				2023-05-25 16:04	232.9
203				2023-05-25 16:05	232.3
204				2023-05-25 16:06	231.6
205				2023-05-25 16:07	231.4
206				2023-05-25 16:08	230.9
207				2023-05-25 16:09	230.5
208				2023-05-25 16:10	230.5
209				2023-05-25 16:11	229.8
210				2023-05-25 16:12	229.1
211				2023-05-25 16:13	228.6
212				2023-05-25 16:14	228.2
213				2023-05-25 16:15	227.9
214				2023-05-25 16:16	227.1
215				2023-05-25 16:17	226.3
216				2023-05-25 16:18	226.1
217				2023-05-25 16:19	226.1
218				2023-05-25 16:20	225.9
219				2023-05-25 16:21	225.7
220				2023-05-25 16:22	224.9
221				2023-05-25 16:23	224.7
222				2023-05-25 16:24	224.3
223				2023-05-25 16:25	224.2
224				2023-05-25 16:26	224.1
225				2023-05-25 16:27	223.6
226				2023-05-25 16:28	223.2
227				2023-05-25 16:29	223.0

228				2023-05-25 16:30	222.7
229				2023-05-25 16:31	222.3
230				2023-05-25 16:32	222.2
231				2023-05-25 16:33	222.1
232				2023-05-25 16:34	221.8
233				2023-05-25 16:35	221.7
234				2023-05-25 16:36	221.5
235				2023-05-25 16:37	221.5
236				2023-05-25 16:38	220.6
237				2023-05-25 16:39	220.7
238				2023-05-25 16:40	220.4
239				2023-05-25 16:41	220.2
240				2023-05-25 16:42	220.2
241				2023-05-25 16:43	220.1
242				2023-05-25 16:44	219.9
243				2023-05-25 16:45	220.0
244				2023-05-25 16:46	219.5
245				2023-05-25 16:47	219.2
246				2023-05-25 16:48	219.3
247				2023-05-25 16:49	219.1
248				2023-05-25 16:50	218.6
249				2023-05-25 16:51	218.1
250				2023-05-25 16:52	217.9
251				2023-05-25 16:53	217.1
252				2023-05-25 16:54	216.8
253				2023-05-25 16:55	216.4
254				2023-05-25 16:56	215.7
255				2023-05-25 16:57	215.4
256				2023-05-25 16:58	215.1
257				2023-05-25 16:59	214.5
258				2023-05-25 17:00	214.0
259				2023-05-25 17:01	213.6
260				2023-05-25 17:02	212.8
261				2023-05-25 17:03	212.6
262				2023-05-25 17:04	212.3
263				2023-05-25 17:05	212.2
264				2023-05-25 17:06	212.4
265				2023-05-25 17:07	211.6
266				2023-05-25 17:08	210.9
267				2023-05-25 17:09	210.4
268				2023-05-25 17:10	210.6
269				2023-05-25 17:11	210.0
270				2023-05-25 17:12	209.6
271				2023-05-25 17:13	209.2
272				2023-05-25 17:14	208.9
273				2023-05-25 17:15	208.9
274				2023-05-25 17:16	208.6
275				2023-05-25 17:17	208.2
276				2023-05-25 17:18	207.8
277				2023-05-25 17:19	207.6
278				2023-05-25 17:20	207.4
279				2023-05-25 17:21	206.8
280				2023-05-25 17:22	206.5
281				2023-05-25 17:23	206.1
282				2023-05-25 17:24	206.0
283				2023-05-25 17:25	205.6
284				2023-05-25 17:26	205.2
285				2023-05-25 17:27	204.8
286				2023-05-25 17:28	204.6
287				2023-05-25 17:29	204.4
288				2023-05-25 17:30	204.2
289				2023-05-25 17:31	203.9
290				2023-05-25 17:32	203.7
291				2023-05-25 17:33	203.5
292				2023-05-25 17:34	203.4
293				2023-05-25 17:35	202.9
294				2023-05-25 17:36	202.6
295				2023-05-25 17:37	202.4
296				2023-05-25 17:38	202.1
297				2023-05-25 17:39	201.6
298				2023-05-25 17:40	201.4
299				2023-05-25 17:41	201.2
300				2023-05-25 17:42	200.8
301				2023-05-25 17:43	200.5
302				2023-05-25 17:44	200.0
303				2023-05-25 17:45	199.7
304				2023-05-25 17:46	199.6
305				2023-05-25 17:47	199.3
306				2023-05-25 17:48	199.1
307				2023-05-25 17:49	198.8

308				2023-05-25 17:50	198.5
309				2023-05-25 17:51	198.1
310				2023-05-25 17:52	197.9
311				2023-05-25 17:53	197.7
312				2023-05-25 17:54	197.6
313				2023-05-25 17:55	197.2
314				2023-05-25 17:56	197.0
315				2023-05-25 17:57	196.7
316				2023-05-25 17:58	196.6
317				2023-05-25 17:59	196.3
318				2023-05-25 18:00	196.4
319				2023-05-25 18:01	196.0
320				2023-05-25 18:02	195.5
321				2023-05-25 18:03	195.4
322				2023-05-25 18:04	195.1
323				2023-05-25 18:05	194.5
324				2023-05-25 18:06	194.5
325				2023-05-25 18:07	194.3
326				2023-05-25 18:08	193.5
327				2023-05-25 18:09	193.5
328				2023-05-25 18:10	193.3
329				2023-05-25 18:11	193.0
330				2023-05-25 18:12	192.7
331				2023-05-25 18:13	192.6
332				2023-05-25 18:14	192.0
333				2023-05-25 18:15	191.7
334				2023-05-25 18:16	191.6
335				2023-05-25 18:17	191.4
336				2023-05-25 18:18	191.2
337				2023-05-25 18:19	191.2
338				2023-05-25 18:20	190.9
339				2023-05-25 18:21	190.5
340				2023-05-25 18:22	190.4
341				2023-05-25 18:23	190.0
342				2023-05-25 18:24	189.8
343				2023-05-25 18:25	189.7
344				2023-05-25 18:26	189.4
345				2023-05-25 18:27	189.1
346				2023-05-25 18:28	189.1
347				2023-05-25 18:29	188.9
348				2023-05-25 18:30	188.7
349				2023-05-25 18:31	188.6
350				2023-05-25 18:32	188.4
351				2023-05-25 18:33	188.0
352				2023-05-25 18:34	187.9
353				2023-05-25 18:35	187.4
354				2023-05-25 18:36	187.5
355				2023-05-25 18:37	187.0
356				2023-05-25 18:38	186.8
357				2023-05-25 18:39	186.4
358				2023-05-25 18:40	186.2
359				2023-05-25 18:41	185.7
360				2023-05-25 18:42	185.8
361				2023-05-25 18:43	185.3
362				2023-05-25 18:44	185.0
363				2023-05-25 18:45	184.4
364				2023-05-25 18:46	184.2
365				2023-05-25 18:47	183.7
366				2023-05-25 18:48	183.5
367				2023-05-25 18:49	183.4
368				2023-05-25 18:50	183.1
369				2023-05-25 18:51	182.7
370				2023-05-25 18:52	182.4
371				2023-05-25 18:53	182.2
372				2023-05-25 18:54	181.8
373				2023-05-25 18:55	181.8
374				2023-05-25 18:56	181.3
375				2023-05-25 18:57	180.9
376				2023-05-25 18:58	180.6
377				2023-05-25 18:59	180.4
378				2023-05-25 19:00	180.2
379				2023-05-25 19:01	179.8
380				2023-05-25 19:02	179.6
381				2023-05-25 19:03	179.2
382				2023-05-25 19:04	179.3
383				2023-05-25 19:05	178.8
384				2023-05-25 19:06	178.7
385				2023-05-25 19:07	178.4
386				2023-05-25 19:08	177.8
387				2023-05-25 19:09	177.4

388				2023-05-25 19:10	176.8
389				2023-05-25 19:11	176.4
390				2023-05-25 19:12	176.0
391				2023-05-25 19:13	175.6
392				2023-05-25 19:14	175.4
393				2023-05-25 19:15	175.1
394				2023-05-25 19:16	174.7
395				2023-05-25 19:17	174.5
396				2023-05-25 19:18	174.0
397				2023-05-25 19:19	173.4
398				2023-05-25 19:20	173.0
399				2023-05-25 19:21	172.8
400				2023-05-25 19:22	172.0
401				2023-05-25 19:23	171.7
402				2023-05-25 19:24	171.3
403				2023-05-25 19:25	170.9
404				2023-05-25 19:26	170.6
405				2023-05-25 19:27	170.5
406				2023-05-25 19:28	170.0
407				2023-05-25 19:29	169.5
408				2023-05-25 19:30	169.4
409				2023-05-25 19:31	168.8
410				2023-05-25 19:32	168.7
411				2023-05-25 19:33	168.3
412				2023-05-25 19:34	167.9
413				2023-05-25 19:35	167.6
414				2023-05-25 19:36	167.2
415				2023-05-25 19:37	166.9
416				2023-05-25 19:38	166.7
417				2023-05-25 19:39	166.4
418				2023-05-25 19:40	166.1
419				2023-05-25 19:41	165.9
420				2023-05-25 19:42	165.7
421				2023-05-25 19:43	165.4
422				2023-05-25 19:44	165.0
423				2023-05-25 19:45	164.8
424				2023-05-25 19:46	164.4
425				2023-05-25 19:47	164.3
426				2023-05-25 19:48	164.0
427				2023-05-25 19:49	163.8
428				2023-05-25 19:50	163.5
429				2023-05-25 19:51	163.5
430				2023-05-25 19:52	163.0
431				2023-05-25 19:53	162.8
432				2023-05-25 19:54	162.5
433				2023-05-25 19:55	162.1
434				2023-05-25 19:56	162.2
435				2023-05-25 19:57	161.9

1.7R Series Pre-burn Data

2023-05-26

Total time (h)

8.78

Wood Specie: Beech								
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)	(-)	(in.)		(min)	(°F)
2023-05-26 10:53	Kindling & SUF	7.34	15.1	18	16.0	Pre-Charge (min)	20	421.8
2023-05-26 11:21	High fire	14.97	20.7	5	16.0	Conditioning (min)	95	581.9
2023-05-26 12:57	Low fire	17.44	19.1	5	16.0	Load (min)	412	284.1

		Average Tflue (°F)	421.8			581.9			284.1
		Pre-Charge (min)	20	Conditioning (min)	95	Load (min)	412		
Air control position	Full open		Full open		Fully closed (or mid point)				
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)			
0	2023-05-26 10:53	66.7	2023-05-26 11:21	535.0	2023-05-26 12:57	414.0			
1	2023-05-26 10:54	140.2	2023-05-26 11:22	544.2	2023-05-26 12:58	434.7			
2	2023-05-26 10:55	164.1	2023-05-26 11:23	568.9	2023-05-26 12:59	547.9			
3	2023-05-26 10:56	194.4	2023-05-26 11:24	582.9	2023-05-26 13:00	638.1			
4	2023-05-26 10:57	264.9	2023-05-26 11:25	578.3	2023-05-26 13:01	604.7			
5	2023-05-26 10:58	328.2	2023-05-26 11:26	571.0	2023-05-26 13:02	597.6			
6	2023-05-26 10:59	366.1	2023-05-26 11:27	573.5	2023-05-26 13:03	582.9			
7	2023-05-26 11:00	393.5	2023-05-26 11:28	573.1	2023-05-26 13:04	576.4			
8	2023-05-26 11:01	427.5	2023-05-26 11:29	572.3	2023-05-26 13:05	574.5			
9	2023-05-26 11:02	454.2	2023-05-26 11:30	580.0	2023-05-26 13:06	564.0			
10	2023-05-26 11:03	492.6	2023-05-26 11:31	586.2	2023-05-26 13:07	550.8			
11	2023-05-26 11:04	512.6	2023-05-26 11:32	590.3	2023-05-26 13:08	520.2			
12	2023-05-26 11:05	513.6	2023-05-26 11:33	593.8	2023-05-26 13:09	492.9			
13	2023-05-26 11:06	515.8	2023-05-26 11:34	597.1	2023-05-26 13:10	470.2			
14	2023-05-26 11:07	518.4	2023-05-26 11:35	597.4	2023-05-26 13:11	449.8			
15	2023-05-26 11:08	523.2	2023-05-26 11:36	599.2	2023-05-26 13:12	429.6			
16	2023-05-26 11:08	523.2	2023-05-26 11:37	601.9	2023-05-26 13:13	412.1			
17	2023-05-26 11:17	597.1	2023-05-26 11:38	607.1	2023-05-26 13:14	416.1			
18	2023-05-26 11:18	602.0	2023-05-26 11:39	612.9	2023-05-26 13:15	447.1			
19	2023-05-26 11:19	608.4	2023-05-26 11:40	617.2	2023-05-26 13:16	448.3			
20	2023-05-26 11:20	650.4	2023-05-26 11:41	621.6	2023-05-26 13:17	438.7			
21			2023-05-26 11:42	624.8	2023-05-26 13:18	424.3			
22			2023-05-26 11:43	641.4	2023-05-26 13:19	413.3			
23			2023-05-26 11:44	644.8	2023-05-26 13:20	404.8			
24			2023-05-26 11:45	648.0	2023-05-26 13:21	397.0			
25			2023-05-26 11:46	652.2	2023-05-26 13:22	390.3			
26			2023-05-26 11:47	659.9	2023-05-26 13:23	385.6			
27			2023-05-26 11:48	669.4	2023-05-26 13:24	382.8			
28			2023-05-26 11:49	679.3	2023-05-26 13:25	381.0			
29			2023-05-26 11:50	688.0	2023-05-26 13:26	381.0			
30			2023-05-26 11:51	695.1	2023-05-26 13:27	382.8			
31			2023-05-26 11:52	697.1	2023-05-26 13:28	386.7			
32			2023-05-26 11:53	702.1	2023-05-26 13:29	390.7			
33			2023-05-26 11:54	699.6	2023-05-26 13:30	396.9			
34			2023-05-26 11:55	694.3	2023-05-26 13:31	400.8			
35			2023-05-26 11:56	689.7	2023-05-26 13:32	404.3			
36			2023-05-26 11:57	683.5	2023-05-26 13:33	413.1			
37			2023-05-26 11:58	676.6	2023-05-26 13:34	421.1			
38			2023-05-26 11:59	674.5	2023-05-26 13:35	428.9			
39			2023-05-26 12:00	674.3	2023-05-26 13:36	433.4			
40			2023-05-26 12:01	674.4	2023-05-26 13:37	437.3			
41			2023-05-26 12:02	673.6	2023-05-26 13:38	440.9			
42			2023-05-26 12:03	671.7	2023-05-26 13:39	442.7			
43			2023-05-26 12:04	668.4	2023-05-26 13:40	444.9			
44			2023-05-26 12:05	667.6	2023-05-26 13:41	445.1			
45			2023-05-26 12:06	666.8	2023-05-26 13:42	447.2			
46			2023-05-26 12:07	665.1	2023-05-26 13:43	449.4			
47			2023-05-26 12:08	662.4	2023-05-26 13:44	450.3			
48			2023-05-26 12:09	660.4	2023-05-26 13:45	450.7			
49			2023-05-26 12:10	655.9	2023-05-26 13:46	449.8			
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52			2023-05-26 12:13	640.6	2023-05-26 13:49	439.4			
53			2023-05-26 12:14	632.6	2023-05-26 13:50	437.0			
54			2023-05-26 12:15	625.7	2023-05-26 13:51	435.4			
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56			2023-05-26 12:17	609.6	2023-05-26 13:53	430.0			
57			2023-05-26 12:18	598.9	2023-05-26 13:54	429.6			
58			2023-05-26 12:19	588.5	2023-05-26 13:55	429.0			
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63			2023-05-26 12:24	551.6	2023-05-26 14:00	429.9			
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66			2023-05-26 12:27	540.5	2023-05-26 14:03	435.5			
67			2023-05-26 12:28	535.3	2023-05-26 14:04	438.6			



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77		2023-05-26 12:38	493.3	2023-05-26 14:14	451.8
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83		2023-05-26 12:44	474.6	2023-05-26 14:20	455.9
84		2023-05-26 12:45	473.2	2023-05-26 14:21	454.2
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234				2023-05-26 16:51	219.3
235				2023-05-26 16:52	218.9
236				2023-05-26 16:53	218.2
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245				2023-05-26 17:02	216.8
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305				2023-05-26 18:02	199.8
306				2023-05-26 18:03	199.5
307				2023-05-26 18:04	199.5

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309				2023-05-26 18:06	199.3
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317				2023-05-26 18:14	198.7
318				2023-05-26 18:15	198.3
319				2023-05-26 18:16	198.2
320				2023-05-26 18:17	198.3
321				2023-05-26 18:18	198.0
322				2023-05-26 18:19	198.0
323				2023-05-26 18:20	197.8
324				2023-05-26 18:21	197.5
325				2023-05-26 18:22	197.3
326				2023-05-26 18:23	197.4
327				2023-05-26 18:24	197.2
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331				2023-05-26 18:28	197.2
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350				2023-05-26 18:47	195.5
351				2023-05-26 18:48	195.3
352				2023-05-26 18:49	195.3
353				2023-05-26 18:50	195.5
354				2023-05-26 18:51	195.7
355				2023-05-26 18:52	195.8
356				2023-05-26 18:53	196.1
357				2023-05-26 18:54	196.1
358				2023-05-26 18:55	196.2
359				2023-05-26 18:56	196.4
360				2023-05-26 18:57	196.4
361				2023-05-26 18:58	196.1
362				2023-05-26 18:59	196.1
363				2023-05-26 19:00	196.5
364				2023-05-26 19:01	196.4
365				2023-05-26 19:02	196.4
366				2023-05-26 19:03	197.0
367				2023-05-26 19:04	197.2
368				2023-05-26 19:05	197.4
369				2023-05-26 19:06	197.5
370				2023-05-26 19:07	197.7
371				2023-05-26 19:08	198.2
372				2023-05-26 19:09	198.5
373				2023-05-26 19:10	199.3
374				2023-05-26 19:11	199.5
375				2023-05-26 19:12	200.0
376				2023-05-26 19:13	200.3
377				2023-05-26 19:14	200.5
378				2023-05-26 19:15	201.0
379				2023-05-26 19:16	200.9
380				2023-05-26 19:17	201.4
381				2023-05-26 19:18	202.0
382				2023-05-26 19:19	202.2
383				2023-05-26 19:20	202.5
384				2023-05-26 19:21	202.6
385				2023-05-26 19:22	202.8
386				2023-05-26 19:23	202.8
387				2023-05-26 19:24	203.4

388				2023-05-26 19:25	203.9
389				2023-05-26 19:26	204.0
390				2023-05-26 19:27	204.2
391				2023-05-26 19:28	204.2
392				2023-05-26 19:29	204.6
393				2023-05-26 19:30	204.4
394				2023-05-26 19:31	204.4
395				2023-05-26 19:32	204.5
396				2023-05-26 19:33	203.9
397				2023-05-26 19:34	203.5
398				2023-05-26 19:35	203.2
399				2023-05-26 19:36	202.8
400				2023-05-26 19:37	202.3
401				2023-05-26 19:38	201.9
402				2023-05-26 19:39	201.6
403				2023-05-26 19:40	201.4
404				2023-05-26 19:41	201.2
405				2023-05-26 19:42	201.2
406				2023-05-26 19:43	200.6
407				2023-05-26 19:44	200.4
408				2023-05-26 19:45	199.9
409				2023-05-26 19:46	199.7
410				2023-05-26 19:47	199.7
411				2023-05-26 19:48	199.1
412				2023-05-26 19:49	198.8

1.7R Series Pre-burn Data

2023-05-29

Total time (h)

7.62

Wood Specie: Beech								
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)	(-)	(in.)		(min)	(°F)
2023-05-29 10:46	Kindling & SUF	7.47	14.7	18	16.0	Pre-Charge (min)	34	528.4
2023-05-29 11:21	High fire	14.99	20.2	5	16.0	Conditioning (min)	68	667.6
2023-05-29 12:32	Low fire	16.53	19.2	5	16.0	Load (min)	355	305.1

		Average Tflue (°F)	528.4			667.6			305.1
		Pre-Charge (min)	34	Conditioning (min)	68	Load (min)	355		
Air control position	Full open		Full open		Fully closed (or mid point)				
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)			
0	2023-05-29 10:46	70.6	2023-05-29 11:21	477.9	2023-05-29 12:32	490.6			
1	2023-05-29 10:47	164.0	2023-05-29 11:22	490.3	2023-05-29 12:33	619.6			
2	2023-05-29 10:48	190.0	2023-05-29 11:23	554.9	2023-05-29 12:34	711.2			
3	2023-05-29 10:49	206.4	2023-05-29 11:24	590.9	2023-05-29 12:35	753.0			
4	2023-05-29 10:50	270.8	2023-05-29 11:25	611.4	2023-05-29 12:36	727.1			
5	2023-05-29 10:51	351.9	2023-05-29 11:26	621.2	2023-05-29 12:37	692.8			
6	2023-05-29 10:52	420.8	2023-05-29 11:27	624.0	2023-05-29 12:38	674.6			
7	2023-05-29 10:53	480.6	2023-05-29 11:28	623.2	2023-05-29 12:39	663.0			
8	2023-05-29 10:54	522.1	2023-05-29 11:29	620.5	2023-05-29 12:40	642.8			
9	2023-05-29 10:55	542.3	2023-05-29 11:30	614.4	2023-05-29 12:41	629.6			
10	2023-05-29 10:56	554.2	2023-05-29 11:31	607.6	2023-05-29 12:42	620.1			
11	2023-05-29 10:57	566.0	2023-05-29 11:32	604.6	2023-05-29 12:43	612.3			
12	2023-05-29 10:58	572.6	2023-05-29 11:33	607.6	2023-05-29 12:44	598.6			
13	2023-05-29 10:59	593.7	2023-05-29 11:34	606.5	2023-05-29 12:45	583.1			
14	2023-05-29 11:00	584.7	2023-05-29 11:35	607.7	2023-05-29 12:46	575.6			
15	2023-05-29 11:01	592.8	2023-05-29 11:36	611.5	2023-05-29 12:47	567.4			
16	2023-05-29 11:02	594.0	2023-05-29 11:37	616.5	2023-05-29 12:48	559.3			
17	2023-05-29 11:03	619.3	2023-05-29 11:38	621.4	2023-05-29 12:49	549.5			
18	2023-05-29 11:04	639.1	2023-05-29 11:39	625.4	2023-05-29 12:50	542.7			
19	2023-05-29 11:05	647.9	2023-05-29 11:40	631.2	2023-05-29 12:51	532.9			
20	2023-05-29 11:06	679.0	2023-05-29 11:41	638.9	2023-05-29 12:52	521.2			
21	2023-05-29 11:07	688.1	2023-05-29 11:42	647.9	2023-05-29 12:53	510.9			
22	2023-05-29 11:08	684.4	2023-05-29 11:43	656.6	2023-05-29 12:54	499.3			
23	2023-05-29 11:09	691.4	2023-05-29 11:44	662.9	2023-05-29 12:55	489.1			
24	2023-05-29 11:10	663.9	2023-05-29 11:45	672.5	2023-05-29 12:56	479.7			
25	2023-05-29 11:11	634.8	2023-05-29 11:46	677.9	2023-05-29 12:57	471.1			
26	2023-05-29 11:12	616.4	2023-05-29 11:47	684.5	2023-05-29 12:58	465.8			
27	2023-05-29 11:13	604.4	2023-05-29 11:48	686.7	2023-05-29 12:59	463.3			
28	2023-05-29 11:14	598.4	2023-05-29 11:49	697.4	2023-05-29 13:00	461.0			
29	2023-05-29 11:15	590.0	2023-05-29 11:50	705.3	2023-05-29 13:01	459.6			
30	2023-05-29 11:16	581.1	2023-05-29 11:51	715.8	2023-05-29 13:02	459.8			
31	2023-05-29 11:17	576.2	2023-05-29 11:52	723.3	2023-05-29 13:03	463.3			
32	2023-05-29 11:18	568.4	2023-05-29 11:53	734.4	2023-05-29 13:04	463.2			
33	2023-05-29 11:19	552.5	2023-05-29 11:54	746.1	2023-05-29 13:05	465.7			
34	2023-05-29 11:20	581.3	2023-05-29 11:55	751.6	2023-05-29 13:06	467.0			
35			2023-05-29 11:56	747.7	2023-05-29 13:07	467.1			
36			2023-05-29 11:57	746.0	2023-05-29 13:08	470.1			
37			2023-05-29 11:58	743.5	2023-05-29 13:09	474.1			
38			2023-05-29 11:59	741.5	2023-05-29 13:10	485.6			
39			2023-05-29 12:00	741.8	2023-05-29 13:11	503.4			
40			2023-05-29 12:01	743.0	2023-05-29 13:12	523.1			
41			2023-05-29 12:02	749.1	2023-05-29 13:13	538.0			
42			2023-05-29 12:03	754.6	2023-05-29 13:14	547.1			
43			2023-05-29 12:04	751.3	2023-05-29 13:15	553.0			
44			2023-05-29 12:05	748.3	2023-05-29 13:16	559.0			
45			2023-05-29 12:06	751.3	2023-05-29 13:17	560.7			
46			2023-05-29 12:07	748.7	2023-05-29 13:18	562.9			
47			2023-05-29 12:08	746.4	2023-05-29 13:19	565.4			
48			2023-05-29 12:09	744.1	2023-05-29 13:20	565.1			
49			2023-05-29 12:10	746.3	2023-05-29 13:21	566.5			
50			2023-05-29 12:11	748.0	2023-05-29 13:22	565.6			
51			2023-05-29 12:12	738.3	2023-05-29 13:23	564.9			
52			2023-05-29 12:13	727.5	2023-05-29 13:24	566.2			
53			2023-05-29 12:14	715.7	2023-05-29 13:25	564.6			
54			2023-05-29 12:15	699.5	2023-05-29 13:26	564.8			
55			2023-05-29 12:16	685.7	2023-05-29 13:27	566.7			
56			2023-05-29 12:17	671.7	2023-05-29 13:28	565.0			
57			2023-05-29 12:18	659.8	2023-05-29 13:29	566.2			
58			2023-05-29 12:19	649.8	2023-05-29 13:30	568.3			
59			2023-05-29 12:20	641.5	2023-05-29 13:31	571.7			
60			2023-05-29 12:21	634.3	2023-05-29 13:32	570.5			
61			2023-05-29 12:22	632.3	2023-05-29 13:33	567.3			
62			2023-05-29 12:23	627.1	2023-05-29 13:34	557.3			
63			2023-05-29 12:24	625.8	2023-05-29 13:35	548.5			
64			2023-05-29 12:25	623.4	2023-05-29 13:36	530.0			
65			2023-05-29 12:26	622.5	2023-05-29 13:37	514.8			
66			2023-05-29 12:27	608.2	2023-05-29 13:38	504.5			
67			2023-05-29 12:28	597.3	2023-05-29 13:39	496.9			

68		2023-05-29 12:31	579.2	2023-05-29 13:40	492.0
69				2023-05-29 13:41	487.4
70				2023-05-29 13:42	485.6
71				2023-05-29 13:43	483.1
72				2023-05-29 13:44	480.4
73				2023-05-29 13:45	479.4
74				2023-05-29 13:46	476.2
75				2023-05-29 13:47	472.1
76				2023-05-29 13:48	469.8
77				2023-05-29 13:49	465.6
78				2023-05-29 13:50	460.9
79				2023-05-29 13:51	458.9
80				2023-05-29 13:52	458.0
81				2023-05-29 13:53	454.3
82				2023-05-29 13:54	450.9
83				2023-05-29 13:55	448.7
84				2023-05-29 13:56	445.8
85				2023-05-29 13:57	443.2
86				2023-05-29 13:58	440.6
87				2023-05-29 13:59	438.6
88				2023-05-29 14:00	434.9
89				2023-05-29 14:01	432.0
90				2023-05-29 14:02	429.2
91				2023-05-29 14:03	426.5
92				2023-05-29 14:04	423.4
93				2023-05-29 14:05	418.9
94				2023-05-29 14:06	416.0
95				2023-05-29 14:07	413.8
96				2023-05-29 14:08	410.6
97				2023-05-29 14:09	407.0
98				2023-05-29 14:10	404.5
99				2023-05-29 14:11	399.9
100				2023-05-29 14:12	395.3
101				2023-05-29 14:13	387.2
102				2023-05-29 14:14	378.1
103				2023-05-29 14:15	368.6
104				2023-05-29 14:16	360.1
105				2023-05-29 14:17	353.6
106				2023-05-29 14:18	346.9
107				2023-05-29 14:19	341.9
108				2023-05-29 14:20	338.0
109				2023-05-29 14:21	334.1
110				2023-05-29 14:22	329.6
111				2023-05-29 14:23	326.0
112				2023-05-29 14:24	322.6
113				2023-05-29 14:25	319.6
114				2023-05-29 14:26	315.6
115				2023-05-29 14:27	312.4
116				2023-05-29 14:28	309.3
117				2023-05-29 14:29	306.5
118				2023-05-29 14:30	303.5
119				2023-05-29 14:31	300.4
120				2023-05-29 14:32	298.0
121				2023-05-29 14:33	295.4
122				2023-05-29 14:34	292.9
123				2023-05-29 14:35	290.8
124				2023-05-29 14:36	289.2
125				2023-05-29 14:37	287.3
126				2023-05-29 14:38	285.1
127				2023-05-29 14:39	283.2
128				2023-05-29 14:40	281.6
129				2023-05-29 14:41	280.1
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131				2023-05-29 14:43	277.6
132				2023-05-29 14:44	277.0
133				2023-05-29 14:45	275.1
134				2023-05-29 14:46	273.5
135				2023-05-29 14:47	272.2
136				2023-05-29 14:48	271.3
137				2023-05-29 14:49	269.9
138				2023-05-29 14:50	268.8
139				2023-05-29 14:51	267.5
140				2023-05-29 14:52	266.0
141				2023-05-29 14:53	265.4
142				2023-05-29 14:54	263.6
143				2023-05-29 14:55	262.5
144				2023-05-29 14:56	262.4
145				2023-05-29 14:57	262.1
146				2023-05-29 14:58	261.0
147				2023-05-29 14:59	260.0

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154				2023-05-29 15:06	256.0
155				2023-05-29 15:07	255.7
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158				2023-05-29 15:10	253.7
159				2023-05-29 15:11	253.8
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161				2023-05-29 15:13	253.2
162				2023-05-29 15:14	253.1
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171				2023-05-29 15:23	247.3
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173				2023-05-29 15:25	245.9
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177				2023-05-29 15:29	242.3
178				2023-05-29 15:30	241.5
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187				2023-05-29 15:39	236.4
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199				2023-05-29 15:51	227.3
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201				2023-05-29 15:53	225.4
202				2023-05-29 15:54	224.2
203				2023-05-29 15:55	222.8
204				2023-05-29 15:56	221.6
205				2023-05-29 15:57	221.0
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207				2023-05-29 15:59	218.7
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210				2023-05-29 16:02	216.3
211				2023-05-29 16:03	215.7
212				2023-05-29 16:04	214.8
213				2023-05-29 16:05	214.4
214				2023-05-29 16:06	213.5
215				2023-05-29 16:07	213.0
216				2023-05-29 16:08	212.3
217				2023-05-29 16:09	211.3
218				2023-05-29 16:10	210.8
219				2023-05-29 16:11	209.6
220				2023-05-29 16:12	209.3
221				2023-05-29 16:13	209.0
222				2023-05-29 16:14	208.5
223				2023-05-29 16:15	207.8
224				2023-05-29 16:16	207.4
225				2023-05-29 16:17	207.0
226				2023-05-29 16:18	206.6
227				2023-05-29 16:19	206.1



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231				2023-05-29 16:23	205.8
232				2023-05-29 16:24	205.7
233				2023-05-29 16:25	205.7
234				2023-05-29 16:26	204.8
235				2023-05-29 16:27	204.2
236				2023-05-29 16:28	203.8
237				2023-05-29 16:29	203.3
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241				2023-05-29 16:33	201.1
242				2023-05-29 16:34	200.7
243				2023-05-29 16:35	200.1
244				2023-05-29 16:36	199.6
245				2023-05-29 16:37	199.0
246				2023-05-29 16:38	198.3
247				2023-05-29 16:39	197.9
248				2023-05-29 16:40	197.5
249				2023-05-29 16:41	196.9
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252				2023-05-29 16:44	196.1
253				2023-05-29 16:45	195.6
254				2023-05-29 16:46	195.3
255				2023-05-29 16:47	195.6
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257				2023-05-29 16:49	195.0
258				2023-05-29 16:50	194.7
259				2023-05-29 16:51	194.6
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261				2023-05-29 16:53	194.1
262				2023-05-29 16:54	194.2
263				2023-05-29 16:55	194.1
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266				2023-05-29 16:58	192.5
267				2023-05-29 16:59	192.6
268				2023-05-29 17:00	192.7
269				2023-05-29 17:01	192.4
270				2023-05-29 17:02	192.4
271				2023-05-29 17:03	192.1
272				2023-05-29 17:04	191.4
273				2023-05-29 17:05	190.9
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275				2023-05-29 17:07	190.7
276				2023-05-29 17:08	189.9
277				2023-05-29 17:09	189.4
278				2023-05-29 17:10	189.5
279				2023-05-29 17:11	189.3
280				2023-05-29 17:12	189.0
281				2023-05-29 17:13	188.7
282				2023-05-29 17:14	188.7
283				2023-05-29 17:15	188.4
284				2023-05-29 17:16	188.3
285				2023-05-29 17:17	188.1
286				2023-05-29 17:18	187.8
287				2023-05-29 17:19	187.3
288				2023-05-29 17:20	187.1
289				2023-05-29 17:21	186.8
290				2023-05-29 17:22	186.7
291				2023-05-29 17:23	186.7
292				2023-05-29 17:24	186.0
293				2023-05-29 17:25	185.8
294				2023-05-29 17:26	185.4
295				2023-05-29 17:27	184.9
296				2023-05-29 17:28	184.9
297				2023-05-29 17:29	184.9
298				2023-05-29 17:30	184.4
299				2023-05-29 17:31	184.1
300				2023-05-29 17:32	183.7
301				2023-05-29 17:33	183.0
302				2023-05-29 17:34	182.8
303				2023-05-29 17:35	182.7
304				2023-05-29 17:36	182.5
305				2023-05-29 17:37	182.1
306				2023-05-29 17:38	181.9
307				2023-05-29 17:39	181.4

308				2023-05-29 17:40	181.1
309				2023-05-29 17:41	180.5
310				2023-05-29 17:42	179.9
311				2023-05-29 17:43	179.8
312				2023-05-29 17:44	179.4
313				2023-05-29 17:45	179.0
314				2023-05-29 17:46	178.6
315				2023-05-29 17:47	178.3
316				2023-05-29 17:48	177.7
317				2023-05-29 17:49	177.4
318				2023-05-29 17:50	177.1
319				2023-05-29 17:51	176.7
320				2023-05-29 17:52	176.7
321				2023-05-29 17:53	176.4
322				2023-05-29 17:54	175.7
323				2023-05-29 17:55	175.3
324				2023-05-29 17:56	175.2
325				2023-05-29 17:57	175.0
326				2023-05-29 17:58	174.4
327				2023-05-29 17:59	174.2
328				2023-05-29 18:00	173.7
329				2023-05-29 18:01	173.0
330				2023-05-29 18:02	172.8
331				2023-05-29 18:03	172.6
332				2023-05-29 18:04	172.2
333				2023-05-29 18:05	171.7
334				2023-05-29 18:06	171.5
335				2023-05-29 18:07	171.1
336				2023-05-29 18:08	171.0
337				2023-05-29 18:09	170.8
338				2023-05-29 18:10	170.5
339				2023-05-29 18:11	170.6
340				2023-05-29 18:12	170.4
341				2023-05-29 18:13	170.0
342				2023-05-29 18:14	169.7
343				2023-05-29 18:15	169.1
344				2023-05-29 18:16	168.9
345				2023-05-29 18:17	169.0
346				2023-05-29 18:18	168.8
347				2023-05-29 18:19	168.6
348				2023-05-29 18:20	168.2
349				2023-05-29 18:21	168.0
350				2023-05-29 18:22	167.7
351				2023-05-29 18:23	167.2
352				2023-05-29 18:24	166.9
353				2023-05-29 18:25	166.4
354				2023-05-29 18:26	166.5
355				2023-05-29 18:27	166.2

1.7R Series Pre-burn Data

2023-05-31

Total time (h)

6.75

Wood Specie: Beech								
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)	(-)	(in.)		(min)	(°F)
2023-05-31 10:40	Kindling & SUF	7.22	15.1	18	16.0	Pre-Charge (min)	33	509.8
2023-05-31 11:14	High fire	14.93	19.1	5	16.0	Conditioning (min)	87	597.2
2023-05-31 12:56	Medium fire	17.43	18.8	5	16.0	Load (min)	285	366.5

		Average Tflue (°F)	509.8	597.2	366.5
		Pre-Charge (min)	33	Conditioning (min)	87
		Load (min)		285	
Air control position	Full open		Full open		Fully closed (or mid point)
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time
0	2023-05-31 10:40	75.9	2023-05-31 11:14	529.9	2023-05-31 12:56
1	2023-05-31 10:41	139.6	2023-05-31 11:15	468.0	2023-05-31 12:57
2	2023-05-31 10:42	159.0	2023-05-31 11:16	512.8	2023-05-31 12:58
3	2023-05-31 10:43	174.4	2023-05-31 11:17	540.6	2023-05-31 12:59
4	2023-05-31 10:44	240.0	2023-05-31 11:18	548.6	2023-05-31 13:00
5	2023-05-31 10:45	336.0	2023-05-31 11:19	557.0	2023-05-31 13:01
6	2023-05-31 10:46	424.4	2023-05-31 11:20	561.1	2023-05-31 13:02
7	2023-05-31 10:47	496.9	2023-05-31 11:21	563.6	2023-05-31 13:03
8	2023-05-31 10:48	506.1	2023-05-31 11:22	565.1	2023-05-31 13:04
9	2023-05-31 10:49	515.2	2023-05-31 11:23	563.7	2023-05-31 13:05
10	2023-05-31 10:50	533.5	2023-05-31 11:24	565.0	2023-05-31 13:06
11	2023-05-31 10:51	550.8	2023-05-31 11:25	565.7	2023-05-31 13:07
12	2023-05-31 10:52	552.3	2023-05-31 11:26	567.0	2023-05-31 13:08
13	2023-05-31 10:53	550.6	2023-05-31 11:27	567.4	2023-05-31 13:09
14	2023-05-31 10:54	549.6	2023-05-31 11:28	563.6	2023-05-31 13:10
15	2023-05-31 10:55	556.7	2023-05-31 11:29	560.4	2023-05-31 13:11
16	2023-05-31 10:56	580.3	2023-05-31 11:30	556.6	2023-05-31 13:12
17	2023-05-31 10:57	593.9	2023-05-31 11:31	552.6	2023-05-31 13:13
18	2023-05-31 10:58	613.5	2023-05-31 11:32	549.6	2023-05-31 13:14
19	2023-05-31 10:59	617.6	2023-05-31 11:33	548.5	2023-05-31 13:15
20	2023-05-31 11:00	619.0	2023-05-31 11:34	548.8	2023-05-31 13:16
21	2023-05-31 11:01	619.3	2023-05-31 11:35	549.9	2023-05-31 13:17
22	2023-05-31 11:02	620.5	2023-05-31 11:36	552.6	2023-05-31 13:18
23	2023-05-31 11:03	620.1	2023-05-31 11:37	557.0	2023-05-31 13:19
24	2023-05-31 11:04	632.1	2023-05-31 11:38	557.9	2023-05-31 13:20
25	2023-05-31 11:05	635.6	2023-05-31 11:39	562.4	2023-05-31 13:21
26	2023-05-31 11:06	630.1	2023-05-31 11:40	573.7	2023-05-31 13:22
27	2023-05-31 11:07	619.4	2023-05-31 11:41	584.6	2023-05-31 13:23
28	2023-05-31 11:08	614.8	2023-05-31 11:42	591.1	2023-05-31 13:24
29	2023-05-31 11:09	611.1	2023-05-31 11:43	597.1	2023-05-31 13:25
30	2023-05-31 11:10	601.5	2023-05-31 11:44	599.9	2023-05-31 13:26
31	2023-05-31 11:11	590.9	2023-05-31 11:45	602.3	2023-05-31 13:27
32	2023-05-31 11:12	580.7	2023-05-31 11:46	605.7	2023-05-31 13:28
33	2023-05-31 11:13	572.1	2023-05-31 11:47	606.6	2023-05-31 13:29
34			2023-05-31 11:48	610.9	2023-05-31 13:30
35			2023-05-31 11:49	614.5	2023-05-31 13:31
36			2023-05-31 11:50	619.5	2023-05-31 13:32
37			2023-05-31 11:51	624.7	2023-05-31 13:33
38			2023-05-31 11:52	625.5	2023-05-31 13:34
39			2023-05-31 11:53	624.4	2023-05-31 13:35
40			2023-05-31 11:54	623.8	2023-05-31 13:36
41			2023-05-31 11:55	623.5	2023-05-31 13:37
42			2023-05-31 11:56	623.5	2023-05-31 13:38
43			2023-05-31 11:57	625.6	2023-05-31 13:39
44			2023-05-31 11:58	628.8	2023-05-31 13:40
45			2023-05-31 11:59	631.4	2023-05-31 13:41
46			2023-05-31 12:00	634.5	2023-05-31 13:42
47			2023-05-31 12:01	638.0	2023-05-31 13:43
48			2023-05-31 12:02	641.9	2023-05-31 13:44
49			2023-05-31 12:03	646.9	2023-05-31 13:45
50			2023-05-31 12:04	649.5	2023-05-31 13:46
51			2023-05-31 12:05	654.6	2023-05-31 13:47
52			2023-05-31 12:06	657.0	2023-05-31 13:48
53			2023-05-31 12:07	659.8	2023-05-31 13:49
54			2023-05-31 12:08	665.0	2023-05-31 13:50
55			2023-05-31 12:09	673.7	2023-05-31 13:51
56			2023-05-31 12:10	688.8	2023-05-31 13:52
57			2023-05-31 12:11	701.9	2023-05-31 13:53
58			2023-05-31 12:12	706.2	2023-05-31 13:54
59			2023-05-31 12:13	709.2	2023-05-31 13:55
60			2023-05-31 12:14	721.5	2023-05-31 13:56
61			2023-05-31 12:15	719.2	2023-05-31 13:57
62			2023-05-31 12:16	708.8	2023-05-31 13:58
63			2023-05-31 12:17	697.9	2023-05-31 13:59
64			2023-05-31 12:18	686.1	2023-05-31 14:00
65			2023-05-31 12:19	668.1	2023-05-31 14:01
66			2023-05-31 12:20	646.8	2023-05-31 14:02
67			2023-05-31 12:21	632.1	2023-05-31 14:03

68		2023-05-31 12:22	620.9	2023-05-31 14:04	567.6
69		2023-05-31 12:23	609.5	2023-05-31 14:05	561.4
70		2023-05-31 12:24	600.1	2023-05-31 14:06	553.4
71		2023-05-31 12:25	593.8	2023-05-31 14:07	546.2
72		2023-05-31 12:26	590.5	2023-05-31 14:08	540.3
73		2023-05-31 12:27	589.6	2023-05-31 14:09	534.7
74		2023-05-31 12:28	585.9	2023-05-31 14:10	528.4
75		2023-05-31 12:29	579.0	2023-05-31 14:11	523.8
76		2023-05-31 12:30	570.0	2023-05-31 14:12	518.1
77		2023-05-31 12:31	562.2	2023-05-31 14:13	514.4
78		2023-05-31 12:32	556.9	2023-05-31 14:14	510.7
79		2023-05-31 12:33	551.7	2023-05-31 14:15	507.2
80		2023-05-31 12:34	548.4	2023-05-31 14:16	502.3
81		2023-05-31 12:35	541.7	2023-05-31 14:17	498.3
82		2023-05-31 12:36	532.3	2023-05-31 14:18	495.3
83		2023-05-31 12:37	523.4	2023-05-31 14:19	492.8
84		2023-05-31 12:38	515.0	2023-05-31 14:20	491.3
85		2023-05-31 12:39	507.0	2023-05-31 14:21	490.7
86		2023-05-31 12:40	499.9	2023-05-31 14:22	488.8
87		2023-05-31 12:40	499.5	2023-05-31 14:23	485.2
88				2023-05-31 14:24	480.9
89				2023-05-31 14:25	477.6
90				2023-05-31 14:26	473.8
91				2023-05-31 14:27	470.5
92				2023-05-31 14:28	467.0
93				2023-05-31 14:29	464.6
94				2023-05-31 14:30	460.9
95				2023-05-31 14:31	457.3
96				2023-05-31 14:32	453.2
97				2023-05-31 14:33	448.6
98				2023-05-31 14:34	445.8
99				2023-05-31 14:35	441.4
100				2023-05-31 14:36	437.5
101				2023-05-31 14:37	433.0
102				2023-05-31 14:38	427.5
103				2023-05-31 14:39	422.9
104				2023-05-31 14:40	418.6
105				2023-05-31 14:41	414.6
106				2023-05-31 14:42	404.2
107				2023-05-31 14:43	396.1
108				2023-05-31 14:44	389.1
109				2023-05-31 14:45	383.6
110				2023-05-31 14:46	378.9
111				2023-05-31 14:47	374.8
112				2023-05-31 14:48	370.6
113				2023-05-31 14:49	367.8
114				2023-05-31 14:50	364.7
115				2023-05-31 14:51	361.7
116				2023-05-31 14:52	359.2
117				2023-05-31 14:53	356.2
118				2023-05-31 14:54	352.1
119				2023-05-31 14:55	349.4
120				2023-05-31 14:56	346.4
121				2023-05-31 14:57	343.3
122				2023-05-31 14:58	340.5
123				2023-05-31 14:59	338.4
124				2023-05-31 15:00	336.6
125				2023-05-31 15:01	334.5
126				2023-05-31 15:02	332.4
127				2023-05-31 15:03	330.4
128				2023-05-31 15:04	329.3
129				2023-05-31 15:05	328.0
130				2023-05-31 15:06	326.0
131				2023-05-31 15:07	324.2
132				2023-05-31 15:08	322.5
133				2023-05-31 15:09	321.0
134				2023-05-31 15:10	319.3
135				2023-05-31 15:11	317.3
136				2023-05-31 15:12	316.1
137				2023-05-31 15:13	314.5
138				2023-05-31 15:14	313.7
139				2023-05-31 15:15	312.4
140				2023-05-31 15:16	310.0
141				2023-05-31 15:17	307.6
142				2023-05-31 15:18	305.5
143				2023-05-31 15:19	304.0
144				2023-05-31 15:20	302.3
145				2023-05-31 15:21	301.0
146				2023-05-31 15:22	300.4
147				2023-05-31 15:23	298.8

148				2023-05-31 15:24	297.9
149				2023-05-31 15:25	296.8
150				2023-05-31 15:26	295.5
151				2023-05-31 15:27	294.3
152				2023-05-31 15:28	293.5
153				2023-05-31 15:29	292.4
154				2023-05-31 15:30	292.0
155				2023-05-31 15:31	290.8
156				2023-05-31 15:32	289.0
157				2023-05-31 15:33	287.2
158				2023-05-31 15:34	285.7
159				2023-05-31 15:35	284.3
160				2023-05-31 15:36	282.9
161				2023-05-31 15:37	281.8
162				2023-05-31 15:38	280.4
163				2023-05-31 15:39	279.5
164				2023-05-31 15:40	278.4
165				2023-05-31 15:41	277.5
166				2023-05-31 15:42	276.5
167				2023-05-31 15:43	275.3
168				2023-05-31 15:44	273.9
169				2023-05-31 15:45	272.8
170				2023-05-31 15:46	271.3
171				2023-05-31 15:47	270.1
172				2023-05-31 15:48	268.9
173				2023-05-31 15:49	267.8
174				2023-05-31 15:50	266.5
175				2023-05-31 15:51	264.7
176				2023-05-31 15:52	263.4
177				2023-05-31 15:53	262.4
178				2023-05-31 15:54	261.7
179				2023-05-31 15:55	260.5
180				2023-05-31 15:56	260.0
181				2023-05-31 15:57	258.9
182				2023-05-31 15:58	257.9
183				2023-05-31 15:59	257.1
184				2023-05-31 16:00	256.3
185				2023-05-31 16:01	255.6
186				2023-05-31 16:02	254.5
187				2023-05-31 16:03	253.6
188				2023-05-31 16:04	252.6
189				2023-05-31 16:05	252.0
190				2023-05-31 16:06	251.2
191				2023-05-31 16:07	250.0
192				2023-05-31 16:08	248.7
193				2023-05-31 16:09	247.8
194				2023-05-31 16:10	247.4
195				2023-05-31 16:11	246.5
196				2023-05-31 16:12	245.7
197				2023-05-31 16:13	244.6
198				2023-05-31 16:14	244.2
199				2023-05-31 16:15	243.5
200				2023-05-31 16:16	242.6
201				2023-05-31 16:17	241.5
202				2023-05-31 16:18	240.9
203				2023-05-31 16:19	240.1
204				2023-05-31 16:20	239.6
205				2023-05-31 16:21	238.9
206				2023-05-31 16:22	238.1
207				2023-05-31 16:23	237.1
208				2023-05-31 16:24	236.0
209				2023-05-31 16:25	235.4
210				2023-05-31 16:26	234.6
211				2023-05-31 16:27	234.2
212				2023-05-31 16:28	233.5
213				2023-05-31 16:29	232.7
214				2023-05-31 16:30	232.2
215				2023-05-31 16:31	231.4
216				2023-05-31 16:32	230.9
217				2023-05-31 16:33	230.1
218				2023-05-31 16:34	229.7
219				2023-05-31 16:35	229.1
220				2023-05-31 16:36	228.6
221				2023-05-31 16:37	226.7
222				2023-05-31 16:38	225.7
223				2023-05-31 16:39	224.8
224				2023-05-31 16:40	223.5
225				2023-05-31 16:41	222.4
226				2023-05-31 16:42	221.8
227				2023-05-31 16:43	221.3

228				2023-05-31 16:44	220.3
229				2023-05-31 16:45	219.9
230				2023-05-31 16:46	219.4
231				2023-05-31 16:47	218.9
232				2023-05-31 16:48	218.2
233				2023-05-31 16:49	218.0
234				2023-05-31 16:50	217.3
235				2023-05-31 16:51	217.0
236				2023-05-31 16:52	216.9
237				2023-05-31 16:53	216.6
238				2023-05-31 16:54	216.5
239				2023-05-31 16:55	216.1
240				2023-05-31 16:56	215.8
241				2023-05-31 16:57	215.1
242				2023-05-31 16:58	215.2
243				2023-05-31 16:59	215.0
244				2023-05-31 17:00	214.5
245				2023-05-31 17:01	214.1
246				2023-05-31 17:02	213.6
247				2023-05-31 17:03	213.1
248				2023-05-31 17:04	213.0
249				2023-05-31 17:05	212.7
250				2023-05-31 17:06	212.3
251				2023-05-31 17:07	211.6
252				2023-05-31 17:08	211.3
253				2023-05-31 17:09	211.2
254				2023-05-31 17:10	210.7
255				2023-05-31 17:11	210.1
256				2023-05-31 17:12	210.1
257				2023-05-31 17:13	209.4
258				2023-05-31 17:14	209.5
259				2023-05-31 17:15	208.9
260				2023-05-31 17:16	209.0
261				2023-05-31 17:17	208.7
262				2023-05-31 17:18	208.6
263				2023-05-31 17:19	208.6
264				2023-05-31 17:20	208.5
265				2023-05-31 17:21	208.5
266				2023-05-31 17:22	208.4
267				2023-05-31 17:23	208.2
268				2023-05-31 17:24	208.1
269				2023-05-31 17:25	207.8
270				2023-05-31 17:26	207.9
271				2023-05-31 17:27	207.6
272				2023-05-31 17:28	207.4
273				2023-05-31 17:29	207.6
274				2023-05-31 17:30	207.6
275				2023-05-31 17:31	207.3
276				2023-05-31 17:32	208.1
277				2023-05-31 17:33	208.3
278				2023-05-31 17:34	208.7
279				2023-05-31 17:35	208.9
280				2023-05-31 17:36	208.8
281				2023-05-31 17:37	208.6
282				2023-05-31 17:38	208.4
283				2023-05-31 17:39	207.9
284				2023-05-31 17:40	207.7
285				2023-05-31 17:41	207.6

1.7R Series Pre-burn Data

2023-06-01

Total time (h)

6.68

Wood Specie: Beech								
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)	(-)	(in.)		(min)	(°F)
2023-06-01 10:48	Kindling & SUF	7.22	14.8	18	16.0	Pre-Charge (min)	32	479.6
2023-06-01 11:21	High fire	14.65	19.2	5	16.0	Conditioning (min)	94	568.1
2023-06-01 13:10	Medium fire	17.08	19.0	5	16.0	Load (min)	275	386.6

Average Tflue (°F)		479.6		568.1		386.6	
Pre-Charge (min)		32		Conditioning (min)		94	
Load (min)				Load (min)		275	
Air control position	Full open		Full open		Fully closed (or mid point)		
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	
0	2023-06-01 10:48	78.2	2023-06-01 11:21	522.9	2023-06-01 13:10	345.9	
1	2023-06-01 10:49	132.2	2023-06-01 11:22	459.2	2023-06-01 13:11	330.5	
2	2023-06-01 10:50	150.0	2023-06-01 11:23	484.0	2023-06-01 13:12	352.3	
3	2023-06-01 10:51	167.4	2023-06-01 11:24	520.1	2023-06-01 13:13	411.2	
4	2023-06-01 10:52	194.5	2023-06-01 11:25	545.5	2023-06-01 13:14	430.5	
5	2023-06-01 10:53	285.1	2023-06-01 11:26	551.8	2023-06-01 13:15	463.9	
6	2023-06-01 10:54	338.0	2023-06-01 11:27	551.7	2023-06-01 13:16	513.8	
7	2023-06-01 10:55	379.0	2023-06-01 11:28	548.6	2023-06-01 13:17	530.7	
8	2023-06-01 10:56	421.4	2023-06-01 11:29	545.3	2023-06-01 13:18	532.9	
9	2023-06-01 10:57	446.1	2023-06-01 11:30	542.7	2023-06-01 13:19	535.9	
10	2023-06-01 10:58	480.2	2023-06-01 11:31	545.6	2023-06-01 13:20	533.9	
11	2023-06-01 10:59	508.2	2023-06-01 11:32	549.2	2023-06-01 13:21	527.0	
12	2023-06-01 11:00	511.9	2023-06-01 11:33	549.3	2023-06-01 13:22	524.9	
13	2023-06-01 11:01	510.5	2023-06-01 11:34	552.2	2023-06-01 13:23	524.7	
14	2023-06-01 11:02	495.5	2023-06-01 11:35	552.4	2023-06-01 13:24	525.6	
15	2023-06-01 11:03	499.3	2023-06-01 11:36	553.9	2023-06-01 13:25	529.5	
16	2023-06-01 11:04	501.7	2023-06-01 11:37	556.0	2023-06-01 13:26	532.1	
17	2023-06-01 11:05	521.6	2023-06-01 11:38	559.0	2023-06-01 13:27	532.8	
18	2023-06-01 11:06	537.9	2023-06-01 11:39	560.1	2023-06-01 13:28	532.9	
19	2023-06-01 11:07	547.2	2023-06-01 11:40	559.9	2023-06-01 13:29	535.1	
20	2023-06-01 11:08	562.7	2023-06-01 11:41	561.6	2023-06-01 13:30	536.6	
21	2023-06-01 11:09	582.5	2023-06-01 11:42	569.1	2023-06-01 13:31	539.0	
22	2023-06-01 11:10	603.3	2023-06-01 11:43	573.6	2023-06-01 13:32	542.0	
23	2023-06-01 11:11	627.2	2023-06-01 11:44	584.8	2023-06-01 13:33	545.9	
24	2023-06-01 11:12	650.8	2023-06-01 11:45	594.8	2023-06-01 13:34	552.2	
25	2023-06-01 11:13	661.5	2023-06-01 11:46	602.1	2023-06-01 13:35	555.9	
26	2023-06-01 11:14	668.7	2023-06-01 11:47	603.5	2023-06-01 13:36	558.2	
27	2023-06-01 11:15	668.9	2023-06-01 11:48	606.4	2023-06-01 13:37	560.5	
28	2023-06-01 11:16	657.4	2023-06-01 11:49	612.2	2023-06-01 13:38	561.8	
29	2023-06-01 11:17	640.8	2023-06-01 11:50	623.7	2023-06-01 13:39	562.6	
30	2023-06-01 11:18	625.5	2023-06-01 11:51	629.5	2023-06-01 13:40	563.9	
31	2023-06-01 11:19	598.6	2023-06-01 11:52	634.3	2023-06-01 13:41	565.8	
32	2023-06-01 11:20	572.6	2023-06-01 11:53	638.7	2023-06-01 13:42	565.9	
33			2023-06-01 11:54	641.9	2023-06-01 13:43	565.2	
34			2023-06-01 11:55	642.5	2023-06-01 13:44	563.7	
35			2023-06-01 11:56	642.8	2023-06-01 13:45	562.7	
36			2023-06-01 11:57	642.2	2023-06-01 13:46	560.8	
37			2023-06-01 11:58	643.6	2023-06-01 13:47	558.2	
38			2023-06-01 11:59	640.7	2023-06-01 13:48	557.7	
39			2023-06-01 12:00	633.2	2023-06-01 13:49	555.5	
40			2023-06-01 12:01	627.1	2023-06-01 13:50	553.0	
41			2023-06-01 12:02	624.5	2023-06-01 13:51	551.7	
42			2023-06-01 12:03	626.6	2023-06-01 13:52	550.4	
43			2023-06-01 12:04	630.8	2023-06-01 13:53	550.2	
44			2023-06-01 12:05	636.8	2023-06-01 13:54	550.1	
45			2023-06-01 12:06	642.4	2023-06-01 13:55	548.4	
46			2023-06-01 12:07	640.5	2023-06-01 13:56	547.8	
47			2023-06-01 12:08	635.4	2023-06-01 13:57	547.7	
48			2023-06-01 12:09	633.6	2023-06-01 13:58	547.3	
49			2023-06-01 12:10	629.8	2023-06-01 13:59	547.9	
50			2023-06-01 12:11	624.2	2023-06-01 14:00	549.2	
51			2023-06-01 12:12	621.5	2023-06-01 14:01	549.2	
52			2023-06-01 12:13	617.6	2023-06-01 14:02	550.2	
53			2023-06-01 12:14	615.2	2023-06-01 14:03	550.5	
54			2023-06-01 12:15	612.8	2023-06-01 14:04	550.5	
55			2023-06-01 12:16	609.3	2023-06-01 14:05	549.3	
56			2023-06-01 12:17	608.2	2023-06-01 14:06	550.5	
57			2023-06-01 12:18	609.4	2023-06-01 14:07	550.9	
58			2023-06-01 12:19	608.6	2023-06-01 14:08	556.0	
59			2023-06-01 12:20	607.4	2023-06-01 14:09	560.6	
60			2023-06-01 12:21	606.2	2023-06-01 14:10	565.1	
61			2023-06-01 12:22	602.9	2023-06-01 14:11	569.8	
62			2023-06-01 12:23	599.8	2023-06-01 14:12	573.4	
63			2023-06-01 12:24	595.0	2023-06-01 14:13	577.9	
64			2023-06-01 12:25	587.8	2023-06-01 14:14	578.9	
65			2023-06-01 12:26	579.7	2023-06-01 14:15	578.2	
66			2023-06-01 12:27	573.5	2023-06-01 14:16	576.0	
67			2023-06-01 12:28	567.1	2023-06-01 14:17	571.7	

68		2023-06-01 12:29	561.4	2023-06-01 14:18	565.7
69		2023-06-01 12:30	554.6	2023-06-01 14:19	562.5
70		2023-06-01 12:31	547.9	2023-06-01 14:20	559.1
71		2023-06-01 12:32	543.3	2023-06-01 14:21	557.3
72		2023-06-01 12:33	539.1	2023-06-01 14:22	554.5
73		2023-06-01 12:34	535.7	2023-06-01 14:23	554.4
74		2023-06-01 12:35	527.3	2023-06-01 14:24	552.8
75		2023-06-01 12:36	521.7	2023-06-01 14:25	549.7
76		2023-06-01 12:37	517.4	2023-06-01 14:26	548.9
77		2023-06-01 12:38	513.7	2023-06-01 14:27	545.9
78		2023-06-01 12:39	510.7	2023-06-01 14:28	543.4
79		2023-06-01 12:40	509.2	2023-06-01 14:29	541.0
80		2023-06-01 12:41	507.8	2023-06-01 14:30	538.7
81		2023-06-01 12:42	506.8	2023-06-01 14:31	536.8
82		2023-06-01 12:43	503.6	2023-06-01 14:32	534.6
83		2023-06-01 12:44	498.4	2023-06-01 14:33	530.3
84		2023-06-01 12:45	490.6	2023-06-01 14:34	528.2
85		2023-06-01 12:46	485.0	2023-06-01 14:35	526.2
86		2023-06-01 12:47	480.2	2023-06-01 14:36	523.8
87		2023-06-01 12:48	488.4	2023-06-01 14:37	521.5
88		2023-06-01 12:49	499.3	2023-06-01 14:38	520.8
89		2023-06-01 12:50	496.6	2023-06-01 14:39	519.9
90		2023-06-01 12:51	489.4	2023-06-01 14:40	518.8
91		2023-06-01 12:52	481.6	2023-06-01 14:41	519.5
92		2023-06-01 12:53	474.0	2023-06-01 14:42	520.2
93		2023-06-01 12:53	473.8	2023-06-01 14:43	520.7
94		2023-06-01 13:09	409.9	2023-06-01 14:44	521.1
95				2023-06-01 14:45	521.5
96				2023-06-01 14:46	522.4
97				2023-06-01 14:47	523.6
98				2023-06-01 14:48	523.0
99				2023-06-01 14:49	521.9
100				2023-06-01 14:50	514.7
101				2023-06-01 14:51	504.0
102				2023-06-01 14:52	492.2
103				2023-06-01 14:53	481.9
104				2023-06-01 14:54	472.9
105				2023-06-01 14:55	464.6
106				2023-06-01 14:56	456.6
107				2023-06-01 14:57	446.8
108				2023-06-01 14:58	435.8
109				2023-06-01 14:59	425.3
110				2023-06-01 15:00	417.2
111				2023-06-01 15:01	408.7
112				2023-06-01 15:02	400.7
113				2023-06-01 15:03	395.3
114				2023-06-01 15:04	388.9
115				2023-06-01 15:05	383.8
116				2023-06-01 15:06	379.2
117				2023-06-01 15:07	374.8
118				2023-06-01 15:08	370.9
119				2023-06-01 15:09	366.8
120				2023-06-01 15:10	363.3
121				2023-06-01 15:11	359.6
122				2023-06-01 15:12	356.6
123				2023-06-01 15:13	353.6
124				2023-06-01 15:14	351.0
125				2023-06-01 15:15	347.9
126				2023-06-01 15:16	344.9
127				2023-06-01 15:17	342.5
128				2023-06-01 15:18	339.7
129				2023-06-01 15:19	336.7
130				2023-06-01 15:20	335.0
131				2023-06-01 15:21	333.0
132				2023-06-01 15:22	330.9
133				2023-06-01 15:23	328.7
134				2023-06-01 15:24	326.7
135				2023-06-01 15:25	324.5
136				2023-06-01 15:26	322.5
137				2023-06-01 15:27	320.6
138				2023-06-01 15:28	318.7
139				2023-06-01 15:29	317.6
140				2023-06-01 15:30	316.0
141				2023-06-01 15:31	314.3
142				2023-06-01 15:32	312.6
143				2023-06-01 15:33	311.2
144				2023-06-01 15:34	310.2
145				2023-06-01 15:35	309.3
146				2023-06-01 15:36	307.8
147				2023-06-01 15:37	306.8



148				2023-06-01 15:38	305.9
149				2023-06-01 15:39	304.8
150				2023-06-01 15:40	304.0
151				2023-06-01 15:41	303.4
152				2023-06-01 15:42	302.0
153				2023-06-01 15:43	301.8
154				2023-06-01 15:44	300.8
155				2023-06-01 15:45	300.3
156				2023-06-01 15:46	299.5
157				2023-06-01 15:47	298.6
158				2023-06-01 15:48	297.3
159				2023-06-01 15:49	295.7
160				2023-06-01 15:50	294.7
161				2023-06-01 15:51	293.3
162				2023-06-01 15:52	292.4
163				2023-06-01 15:53	291.7
164				2023-06-01 15:54	291.2
165				2023-06-01 15:55	290.5
166				2023-06-01 15:56	289.5
167				2023-06-01 15:57	288.7
168				2023-06-01 15:58	288.0
169				2023-06-01 15:59	287.5
170				2023-06-01 16:00	287.3
171				2023-06-01 16:01	286.5
172				2023-06-01 16:02	285.9
173				2023-06-01 16:03	285.4
174				2023-06-01 16:04	285.2
175				2023-06-01 16:05	284.7
176				2023-06-01 16:06	284.3
177				2023-06-01 16:07	283.9
178				2023-06-01 16:08	284.0
179				2023-06-01 16:09	283.3
180				2023-06-01 16:10	282.8
181				2023-06-01 16:11	282.9
182				2023-06-01 16:12	282.4
183				2023-06-01 16:13	282.3
184				2023-06-01 16:14	282.0
185				2023-06-01 16:15	282.1
186				2023-06-01 16:16	282.0
187				2023-06-01 16:17	282.0
188				2023-06-01 16:18	281.5
189				2023-06-01 16:19	281.7
190				2023-06-01 16:20	281.3
191				2023-06-01 16:21	281.4
192				2023-06-01 16:22	281.3
193				2023-06-01 16:23	281.2
194				2023-06-01 16:24	281.4
195				2023-06-01 16:25	281.3
196				2023-06-01 16:26	281.2
197				2023-06-01 16:27	281.1
198				2023-06-01 16:28	281.4
199				2023-06-01 16:29	281.7
200				2023-06-01 16:30	281.4
201				2023-06-01 16:31	281.4
202				2023-06-01 16:32	280.9
203				2023-06-01 16:33	281.2
204				2023-06-01 16:34	281.0
205				2023-06-01 16:35	280.6
206				2023-06-01 16:36	280.5
207				2023-06-01 16:37	280.4
208				2023-06-01 16:38	280.6
209				2023-06-01 16:39	280.2
210				2023-06-01 16:40	279.9
211				2023-06-01 16:41	279.4
212				2023-06-01 16:42	279.1
213				2023-06-01 16:43	278.7
214				2023-06-01 16:44	278.3
215				2023-06-01 16:45	278.0
216				2023-06-01 16:46	277.4
217				2023-06-01 16:47	276.8
218				2023-06-01 16:48	276.1
219				2023-06-01 16:49	275.5
220				2023-06-01 16:50	274.9
221				2023-06-01 16:51	274.0
222				2023-06-01 16:52	273.1
223				2023-06-01 16:53	272.6
224				2023-06-01 16:54	271.9
225				2023-06-01 16:55	271.5
226				2023-06-01 16:56	271.2
227				2023-06-01 16:57	271.0

228				2023-06-01 16:58	269.9
229				2023-06-01 16:59	269.2
230				2023-06-01 17:00	269.3
231				2023-06-01 17:01	268.5
232				2023-06-01 17:02	267.9
233				2023-06-01 17:03	267.9
234				2023-06-01 17:04	267.5
235				2023-06-01 17:05	266.4
236				2023-06-01 17:06	266.0
237				2023-06-01 17:07	265.5
238				2023-06-01 17:08	264.9
239				2023-06-01 17:09	264.4
240				2023-06-01 17:10	264.3
241				2023-06-01 17:11	264.1
242				2023-06-01 17:12	264.1
243				2023-06-01 17:13	264.2
244				2023-06-01 17:14	263.9
245				2023-06-01 17:15	263.9
246				2023-06-01 17:16	263.7
247				2023-06-01 17:17	263.5
248				2023-06-01 17:18	262.6
249				2023-06-01 17:19	262.2
250				2023-06-01 17:20	261.8
251				2023-06-01 17:21	261.2
252				2023-06-01 17:22	261.2
253				2023-06-01 17:23	260.8
254				2023-06-01 17:24	260.7
255				2023-06-01 17:25	260.5
256				2023-06-01 17:26	259.8
257				2023-06-01 17:27	259.1
258				2023-06-01 17:28	258.4
259				2023-06-01 17:29	258.2
260				2023-06-01 17:30	257.5
261				2023-06-01 17:31	257.3
262				2023-06-01 17:32	256.9
263				2023-06-01 17:33	256.6
264				2023-06-01 17:34	256.7
265				2023-06-01 17:35	256.4
266				2023-06-01 17:36	256.4
267				2023-06-01 17:37	254.7
268				2023-06-01 17:38	253.9
269				2023-06-01 17:39	252.3
270				2023-06-01 17:40	251.1
271				2023-06-01 17:41	249.8
272				2023-06-01 17:42	248.4
273				2023-06-01 17:43	247.6
274				2023-06-01 17:44	246.8
275				2023-06-01 17:45	245.3

WOOD HEATER TESTING SUMMARY

SECTION 1 – Model Identification

Model Name(s)/Number(s)  
Manufacturer  
Address 1  
Address 2  
Appliance Category(s) (Free-standing, Insert, etc.)  
Usable Firebox Volume - ft<sup>3</sup>  
Catalytic/Non-Cat  
Convection Air Fan (No, Standard, Optional)

1.7R Series  
SBI  
250 Rue de Copenhagen  
St-Augustin-de-Desmaures, QC G3A 2H2  
Free-standing  
1.44  
Non-Cat  
Standard

SECTION 1B – Laboratory Information

Testing Laboratory  
Address 1  
Address 2  
ISO/Accreditation Info  
Dates Tested  
Test Methods/Standards  
Dilution Tunnel Inside Diameter - in.  
Filter Diameter - mm  
Filter Material

PFS-TECO  
11785 SE Hwy 212 Ste 305  
Clackamas, OR 97015  
ISO 17025  
6/6/23 - 6/9/23  
ASTM E3053 (ATM dated 11/1/2022)  
8.00  
47  
Pall Type TX40

SECTION 2 – Test Conditions Summary

Test Run #	1	2	3	4	5	6	7	8
Date Tested	6/6/2023	6/6/2023	6/7/2023	6/7/2023	6/8/2023	6/8/2023	6/9/2023	6/9/2023
Test Run Category (L, M, H)	High Fire	Low Fire	High Fire	Medium Fire	High Fire	High Fire	High Fire	High Fire
Average Barometric Pressure - in Hg	29.48	29.43	29.32	29.38	29.54	29.56	29.59	29.51
Max. Observed Ambient Temp - °F	83	90	89	90	90	88	88	88
Min. Observed Ambient Temp - °F	70	77	76	80	77	74	76	76
Max. Observed Filter Temp - °F	88	90	88	88	88	88	87	89
Test Fuel Load								
Cordwood Fuel Species	Beech	Beech	Beech	Beech	Beech	Beech	Beech	Beech
Specific Gravity (from Table 1)	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Higher Heating Value - Btu/lb (from Annex A1)	8088	8088	8088	8088	8088	8088	8088	8088
Nom. Test Fuel Load Piece Length - in.	16	16	16	16	16	16	16	16
Number of Test Fuel Pieces	5	5	5	5	5	5	5	5
Test Fuel Weight								
Kindling - As Fired lb	2.90	N/A	2.86	N/A	2.82	2.98	2.91	2.85
Kindling Wt. - As % of Test Fuel Load	20%	N/A	20%	N/A	19%	20%	20%	19%
Kindling Moisture - % DB	10%	N/A	10%	N/A	10%	10%	10%	10%
Kindling - kg DB	1.20	N/A	1.18	N/A	1.16	1.23	1.20	1.17
SU Fuel - As Fired lb	4.35	N/A	4.29%	N/A	399%	425%	398%	398%
SU Fuel Wt. - As % of Test Fuel Load	30%	N/A	30%	N/A	27%	28%	27%	26%
SU Fuel Moisture - % DB	23%	N/A	21%	N/A	20%	21%	21%	24%
SU Fuel - kg DB	1.60	N/A	1.61	N/A	1.50	1.59	1.49	1.46
Test Fuel Load - As Fired lb	14.742	17.518	14.431	17.416	14.737	15.047	14.822	15.059
Ave. Test Fuel Load MC % DB	21.2%	21.5%	20.9%	20.4%	22.2%	20.9%	20.1%	20.0%
Test Fuel Load - kg DB	5.52	6.54	5.41	6.56	5.47	5.65	5.60	5.69
Test Fuel Loading Density - lb/ft <sup>3</sup>	10.24	12.17	10.02	12.09	10.23	10.45	10.29	10.46
Residual SU Fuel Wt. - As Fired lb	1.98	N/A	205%	N/A	232%	188%	188%	170%
Residual SU Fuel Wt. - As % of Test Fuel Load	13%	N/A	14%	N/A	16%	12%	13%	11%
Test Run Duration - minutes	107	508	125	345	132	127	112	106
Test Run Duration - h	1.78	8.47	2.08	5.75	2.20	2.12	1.87	1.77
Run Duration of High Fire Load Only - minutes	71	N/A	86	N/A	100	87	79	69
Run Duration of High Fire Load Only - h	1.18	N/A	1.43	N/A	1.67	1.45	1.32	1.15
Test Fuel Load Wt. at End of Test - As Fired lb	1.5	0	1.54	0	1.34	1.4	1.34	1.4
Total Fuel Burned - kg DB	6.72	6.54	6.57	6.56	6.47	6.98	6.83	6.92
% Test Fuel Load Wt. at End of Test	10.4%	0.0%	10.7%	0.0%	9.1%	9.3%	9.0%	9.3%

**SECTION 3 – Test Run Results Summary**

Test Run #	1	2	3	4	5	6	7	8	HF Avgs*
Date Tested	6/6/23	6/6/23	6/7/23	6/7/23	6/8/23	6/8/23	6/9/23	6/9/23	
Test Run Category	High Fire	Low Fire	High Fire	Medium Fire	High Fire	High Fire	High Fire	High Fire	
Burn Rate - kg/h DB	4.07	0.77	3.29	1.14	2.92	3.46	3.79	4.40	3.93
Heat Output - Btu/h	51,181	9,836	39,701	13,569	35,694	41,004	44,947	52,205	47,334
Average Dilution Tunnel Flow Rate - dscfm	473.06	361.62	469.82	479.65	472.79	472.53	476.83	476.83	
Average Sample Flow Rates - dscfm									
Train 1	0.180	0.189	0.177	0.186	0.178	0.145	0.143	0.143	
Train 2	0.175	0.185	0.173	0.183	0.172	0.142	0.140	0.140	
Total PM Emissions - g									
Train 1	5.84	15.91	13.95	11.18	23.27	6.59	9.33	11.79	
Train 2	5.19	16.27	16.02	10.37	21.82	7.75	10.60	11.41	
Average	5.515	16.090	14.985	10.777	22.545	7.171	9.967	11.597	
PM Emission Train Precision - %	5.8%	1.1%	6.9%	3.8%	3.2%	8.1%	6.4%	1.6%	
PM Emission Train Precision - g/kg	0.05	0.03	0.16	0.06	0.11	0.08	0.09	0.03	
PM Emission Rate - g/h	3.1	1.9	7.2	1.9	10.2	3.4	5.3	6.6	4.6
Total CO Emissions - g	121	496	96	267	151	246	262	400.6	257.5
CO Emissions Rate - g/h	103	59	67	47	91	170	199	348	205
Overall Efficiency - CSA B415.1-10									
% HHV Basis	69%	71%	66%	67%	67%	65%	65%	65%	66%
% LHV Basis	74%	76%	71%	71%	71%	70%	70%	70%	71%

**SECTION 4 - Weighted Average Summary**

\*Runs 3 & 5 excluded from average using 2/3 of test runs

Test Run Category	High Fire	Low Fire	Medium Fire
Burn Rate - kg/h DB	3.93	0.77	1.14
PM Emission Rate - g/h	4.60	1.90	1.87
CO Emissions Rate - g/h	205	59	47
Overall Efficiency - CSA B415.1-10			
% HHV Basis	66%	71%	67%
% LHV Basis	71%	76%	71%
Heat Output - Btu/h	47334	9800	13600
Category Weighting	20%	40%	40%

**ASTM E 3053 Weighted Averages**

PM Emission Rate - g/h	2.43
CO Emissions Rate - g/h (Arithmetic Average)	103.3
CO Emissions Rate - g/min (Arithmetic Average)	1.7
Overall Efficiency - CSA B415.1-10	
% HHV Basis	68%
% LHV Basis	73%
Heat Output Range - Btu/h	9800 to 52200*

\*Heat output range determined from highest of individual runs from those included in weighted average calculations



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
RESEARCH TRIANGLE PARK, NC 27711

Mr. Bernard Blouin  
Mechanical Engineer  
Stove Builder International, Inc.  
250, De Copenhague  
St-Augustin-de-Desmaures (Qc)  
G3A 2H3, Canada

OFFICE OF  
AIR QUALITY PLANNING  
AND STANDARDS

11/01/2022

Dear Mr. Blouin,

This letter is in response to your correspondence, which started August 24, 2022, went through several iterations, email discussions and resulted in a final letter dated October 27, 2022. In your letters, you request the use of alternative testing procedures to demonstrate compliance with 40 CFR part 60, Subpart AAA – Standards of Performance for New Residential Wood Heaters (Subpart AAA). The Office of Air Quality Planning and Standards, as the delegated authority, must make the determination on any major alternatives to test methods and procedures required under 40 CFR parts 59, 60, 61, 63, and 65. Your proposed alternative testing procedures and our approval decisions are discussed below.

According to the information provided in your correspondence, you seek an alternative test method and testing procedures for use when conducting testing on the Stove Builder International Inc. (SBI) 1.7R Series. Currently, as required by section 60.534(a)(2) of Subpart AAA, a manufacturer, when using the 2020 cord wood alternative compliance option, must have their appliance tested by an EPA-approved test laboratory and the testing conducted with cord wood using an alternative cord wood test method approved by the EPA Administrator or their delegated authority to establish the certification test conditions and the particulate matter (PM) emission values.

Your request seeks to use the specified modifications, detailed below, coupled with ASTM E3053-18 *Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters Using Cordwood Test Fuel* (ASTM E3053-18) as the alternative cord wood test method to certify the SBI 1.7R Series model line. In your request, you state that the SBI 1.7R Series is a room heater and that you are seeking a cord wood alternative test method to use for compliance testing. You also state, in your request letter, that your appliance has a usable firebox volume of 1.44 ft<sup>3</sup> and an overall firebox volume of 1.86 ft<sup>3</sup>. Because the longest length of your usable firebox is 19.625 inches, you state that you will use cord wood fuel between 15.70 inches to 18.64 inches in length for testing which represents 80% to 95% of the usable firebox length. In your request, you state that you would like to use Beech or Maple cord wood for compliance testing. These two fuels are among the allowable fuel species specified in ASTM E3053-18 according to Figure 2 “Specific Gravity of Commercially Imported Species of Wood Based on Oven-Dry Weight and Oven-Dry Volume.”

We understand from your request, that you also seek use of a number of alternative testing procedures, detailed in the second list below, when conducting sampling as required by 40 CFR 60.534(c), which requires that PM emission concentrations be measured using ASTM E2515-11 *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel* (ASTM E2515-11). Additionally, in your request, you seek to use a separate ASTM E2515-11 sampling train for collecting the first hour of PM emissions, as is required by 40 CFR 60.534(d) that states the “approved test laboratory must also measure the first hour of PM emissions for each test run using a separate filter in one of the two parallel trains.” This third, identical and independent sampling train when used to sample concurrently for the first hour of the PM compliance testing will independently measure the first hour of PM emissions for each test run, thus avoiding the need to change filters in one of the paired trains.

Based on the information provided and with the caveats set forth below, we are approving your request to use ASTM E3053-18 as the alternative cord wood test method when conducting certification testing as required by Subpart AAA, section 60.534(a)(2) on the SBI 1.7R Series room heater with the modifications detailed below.

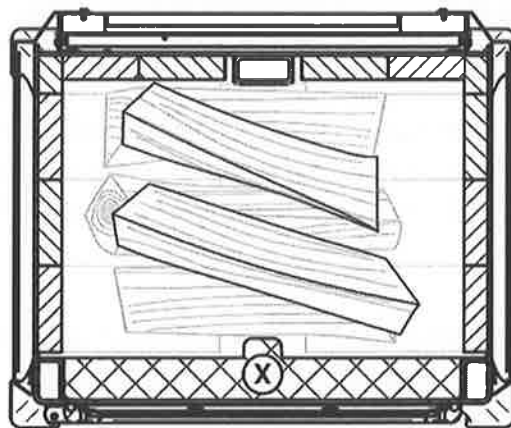
When using ASTM E3053-18 as the alternative cord wood test method to certify the SBI 1.7R Series, these changes and modifications must be made:

1. Section 3.2.3 - Additional requirements:
  - a. No square or near-square fuel pieces are allowed. A variety of test fuel piece shapes in each load is allowed.
  - b. The top of any trapezoidal shaped piece may not be greater in dimension than 70% of the base dimension of the trapezoid.
2. Sections 3.2.6 and 8.4.2.8 - Modification to the requirements:
  - a. Fuel length must represent 80% to 95% of the longest length of the usable firebox volume. This represents a range of 15.70 inches to 18.64 inches based on the longest firebox dimension of 19.625 inches. **Your request stated that you will use a fuel length of 16 inches for all testing.**
  - b. All test fuel used must be the same nominal length  $\pm 0.25$  inches.
  - c. **There will be no additional  $\pm 1$  inch allowance to the nominal length as stated in the ASTM method.**
3. Sections 8.1.4, 8.1.5, 8.1.6 and 8.1.7 - Additional requirements:
  - a. Conduct 50 hours of pre-conditioning at multiple burn rates (high, medium, and low).
  - b. Pre-conditioning data shall include all fuel parameters (species, moisture content, load weights, piece amounts, and length of fuel), air settings used, time spent in each air setting phase, and amount of fuel burned at each air setting.
  - c. Pre-conditioning fuel length can be different than the required testing fuel length. (e.g., 15 inches long is acceptable even if not in the 80% to 95% of longest firebox dimension range.
  - d. Photos must be provided in the test report of the air settings used for pre-conditioning of the appliance.

4. Section 8.3 - Additional requirements:

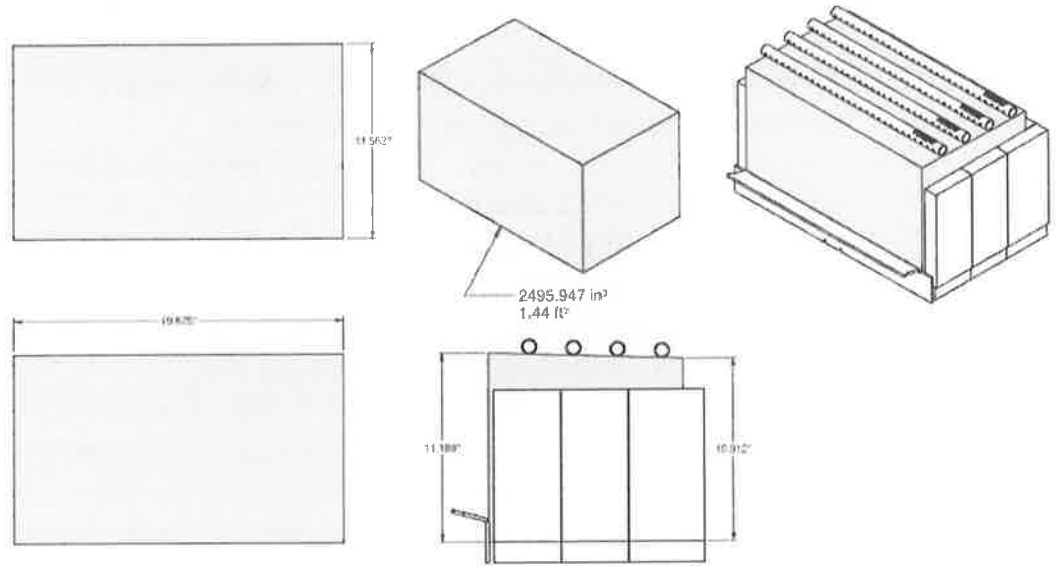
- a. Overall firebox dimensions and usable firebox dimensions must have been provided to EPA prior to alternative method approval. In addition, the usable firebox dimensions must be illustrated in the Owner's Manual with instructions to the end user for appropriate fueling/loading.
- b. Overall firebox volume and usable firebox volume must also be reported in the test report and must agree with dimensions stated in this letter.
- c. Fuel load density must be based on the usable firebox dimensions listed below in this alternative test method approval.
  - i. On the SBI 1.7R Series, the Usable Firebox Volume (UFV) is smaller than the Overall Firebox Volume. The reason for this is because wood should not be placed on the lower primary air intake channel. As provided, the User's Owner's Manual section 2.4 for the SBI 1.7R Series specifies:

*“The best loading method for efficient and clean combustion with this fireplace is the EPA loading method. The images...show the space in the firebox where the logs are to be placed. It is important to always respect this space and not to put logs in the grid area marked with an X. The marked area is defined by the space between the glass and primary air channel. Leave enough space between the logs for good air circulation. Using more than the usable firebox volume for loading wood will result in poor combustion. The Usable firebox volume of 1.44 ft<sup>3</sup> shown below is the one used during EPA emissions certification. The log length recommended for this stove is 16 inches and the EPA testing were done with log length of 16 in. The fuel specie used for the EPA certification was beech.”*





ii. SBI 1.7R Series UFV schematic:



iii. SBI 1.7R Series UFV calculation:

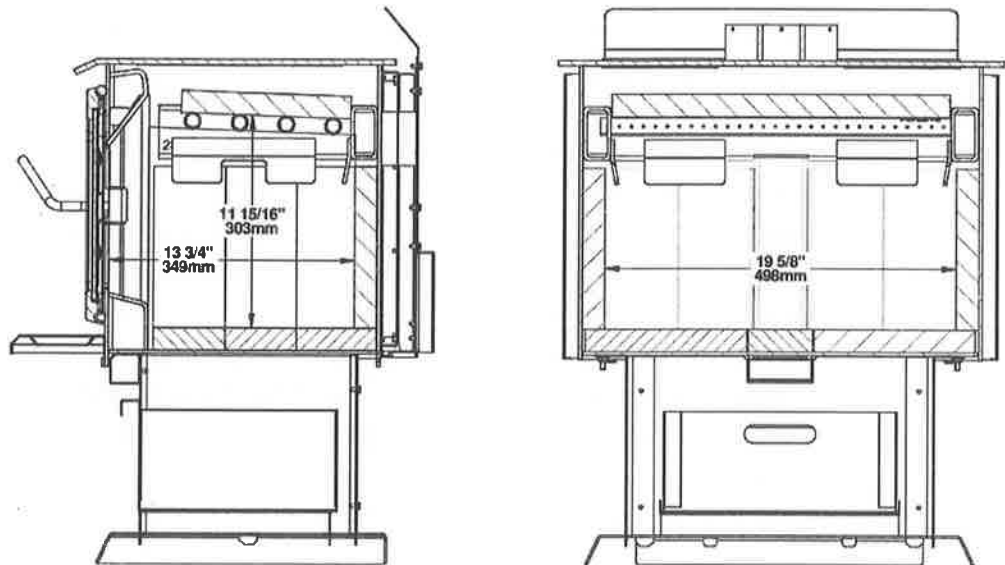
$$UFV = 11.562 \times 19.625 \times \frac{11.188 + 10.812}{2} = 2495.947 \text{ in}^3$$

$$UFV = \frac{2495.947}{12^3} = 1.44 \text{ ft}^3$$

- d. The overall firebox volume (OFV) is for marketing purposes only. The overall firebox calculation is not intended to be used for testing, as it includes areas of the firebox that the test fuel load is not permitted to be placed into. This area is a buffer zone to allow an easier fuel insertion, to prevent ash spillage and to allow the air wash to work properly. The calculation presents below is an approximation of the volume a consumer could easily confirm using a measuring tape. As provided, the User's Owner's Manual section 2.1 for the 1.7 series specifies:

*“The overall firebox calculation is an approximation and is not intended to be used for loading. This volume includes a buffer zone to allow an easier fuel insertion, prevent ash spillage and allow the air wash to work properly.”*

i. SBI 1.7R Series overall firebox volume (OFV) calculation:



$$OFV = 13.75 \times 19.625 \times 11.9375 = 3221.260 \text{ in}^3$$

$$OFV = \frac{3221.260}{12^3} = 1.86 \text{ ft}^3$$

5. Section 8.4.2.1 - Additional requirements:
  - a. Beech or maple must be used as the species for cord wood.
  - b. If the test fuel pieces have adhered bark, the bark must not be removed. Specifically, the bark side of the fuel species shall not be split off parallel to the bark when fuel weight adjustments are being made to achieve piece or load weight requirements.
6. Section 8.4.2.6 - Additional requirement:
  - a. The test fuel may not be thermally dried in order to achieve the target moisture range for the test fuel.
7. Section 8.5 - Additional requirements:
  - a. Emissions must be measured and reported from all start-up/high fire test runs.
  - b. First hour emissions must be included for every test run.
  - c. The trains must not be disassembled until after a post-test leak check is performed.
  - d. The manual blower of the SBI 1.7R Series is operated manually. **After the high fire test load has been loaded in the stove and the door has been closed as per instructions in ASTM E3053 Section 8.5.9.4, the manual blower must be immediately engaged on the highest setting.**
8. Sections 8.5.4 and 8.6.3 – Additional requirements:
  - a. Test fuel load density for the high fire test must not be less than 10.0 lb/ft<sup>3</sup> of the usable

- firebox volume. For the low and medium fire test the test fuel load density must not be less than 12.0 lb/ft<sup>3</sup> of the usable firebox volume.
9. Sections 8.5.5, 8.5.6 and 8.5.7 - Additional requirements:
    - a. Manufacturer's instructions to the test lab must all be in writing and all these documents must be included in the test report.
    - b. Kindling and start-up instructions are limited to top-down start, or bottom-up start direction. **There must be no discussion regarding fuel spacing and piece size in the instructions to the lab.** However, general guidance on kindling and start-up fuel arrangement can be supplied (e.g., Split the start-up fuel piece into 6 pieces, use between 10-15 pieces of kindling, put the biggest pieces on the bottom and the smallest on top, stack into 5 to 7 layers).
  10. Section 8.5.9.3 and 8.6.9.2 and 8.6.9.2 - Additional requirements:
    - a. The fuel pieces placed directly on the coal bed must be loaded in an East-West orientation, using the door to represent a South position and the back wall of the firebox to represent a North position. When test fuel is loaded no effort shall be made to stack fuel pieces either tightly or loosely with respect to one another.
    - b. Fuel pieces that are loaded on top of the lower layer of fuel pieces may be slightly angled, refer to the manufacturer's written instructions (Loading Procedure) for more details.
  11. Sections 8.5.9.5 (1), (2) and 8.6.8 (1), (2) - Additional requirements:
    - a. Documentation must be provided in the test report of all test fuel load adjustments made during testing.
    - b. Documentation must include photos of the fuel load before and after any test fuel load adjustment is made and the time that this occurred.
  12. Sections 8.5.2 and 8.5.3 - Additional requirements:
    - a. The air control setting must be at the full open setting for the high fire test.
    - b. Photos must be taken of the air control set point for each test run and provided in the test report.
    - c. Follow Owner's Manual on how to properly operate the secondary air control.
  13. Sections 8.6.7 through 8.7.1.2 - Additional requirements:
    - a. The low fire air control setting must be the lowest setting at which the user can operate the unit. The test report and the Owner's Manual must illustrate where the air inlet control is set to achieve the low fire condition.
    - b. Photos must be taken of the air control set point for each test run and provided in the test report.
    - c. Follow the Owner's Manual on how to properly operate the secondary air control.
    - d. The manual blower of the SBI 1.7R Series is operated manually. **The manual blower must be operated on its highest setting and engaged as soon as the combustion air control adjustment period has elapsed.**
  14. Sections 8.6.7 through 8.8.1.3 - Additional requirements and modification of requirements:
    - a. The medium fire test combustion air control setting must be set halfway between the lowest and the highest primary air control settings as measured on the control actuator

(lever, knob, slide etc.). Simulating how the homeowner would determine a medium setting on the control actuator (lever, knob, slide, etc.).

- i. Ideally, the air flow setting being placed at the halfway point would result in a medium burn rate at least 1.3 times the low burn rate. **If the physical halfway point results in a medium burn rate less than 1.3 times the low burn rate, then you must use an air setting that will result in a medium burn rate that meets the criteria defined in Equation 1.** At maximum, you may adjust up to 7 mm (out of 46 mm of full travel) to increase the combustion air to meet the target medium burn rate.
- ii. If the medium burn rate at the halfway point setting does not result in a burn rate 1.3 times the low burn rate, the medium burn rate test must be repeated until it falls within these criteria.

1. *Nomenclature:*

$L_{BR}$  = Low burn rate at 100% fuel consumption (kg/hr dry basis)

$M_1$  = Burn rate 1

Equation 1:

$$M_1 = L_{BR} * 1.3$$

**The medium burn rate must be  $\geq M_1$ .**

- iii. If multiple medium burn rate tests are conducted (even if the medium burn test falls below 1.3 x low burn rate), the particulate matter results and accompanying test data must be included in the test report and must be included the overall PM average.
- b. Photos must be taken of the air control set point for each test run and provided in the test report.
- c. Follow the Owner's Manual instructions on how to properly operate the secondary air control.
- d. Due to the instructions provided above in 14(a), The provisions in ASTM E-3053 that would require retesting of the medium fire test category per section 8.8.1 do not apply.
- e. The manual blower of the SBI 1.7R Series is operated manually. **The manual blower must be operated on its highest setting and engaged as soon as the combustion air control adjustment period has elapsed.**

15. Sections 3.2.10 through 3.2.11 - Additional requirements:

- a. The manufacturer is allowed to provide written instructions to the lab related to the kindling and start-up (top-down or bottom-up light off), the type of fuel they wish to use for the test, the air control settings for the medium burn, information related to usable firebox dimensions, position of the load door during kindling/startup, high, low and medium fire loading, appliance set-up, and appliance venting. Details on general appliance operation are allowed to be provided but are not allowed to override any specifications in this alternative method approval or other requirements found in ASTM E3053-18, ASTM E2515-11 or in 40 CFR 60, subpart AAA.

- b. Certification testing procedures must be consistent with information contained in the Owner's Manual and the manufacturer's written instructions to the lab.
- c. All fuel loading and door closing procedures as instructed to the test lab must be included in the Owner's Manual.

16. Sections 8.2.7 through 8.6.9.1 - Additional requirements:

- a. Clear and representative (close-up) photos must be in the report (no photos from across the room or signs that are illegible).
- b. Take a close-up photo of the collective fuel load cross section and provide this photo in the test report.
- c. Photo of the complete test installation including venting, front view of stove, rear view of stove and side view of stove.
- d. Photo of the empty firebox.
- e. Photo of kindling and start-up before it is placed in the firebox.
- f. Photo of kindling and start-up fuel in firebox before ignition.
- g. Photo of residual start-up fuel bed before and after raking.
- h. Photo of test fuel load before and after it is placed in firebox.
- i. Photo of residual fuel bed before and after raking (after high fire test).
- j. If there are fuel adjustments, provide a description and a before and after photo.
- k. Photos must be taken of the air control set point for each test run and provided in the test report.

17. Rounding convention - Additional requirements:

- a. Follow Technical Information Document 024 - Memo on Rounding and Significant Figures for rounding conventions: <https://www.epa.gov/emc/technical-information-document-024-memo-rounding-and-significant-figures>

18. Coal bed conditions – Modification of requirement:

- a. Coal bed conditions prior to loading test fuel. The coal bed shall be a level plane without valleys or ridges for all test runs in the high, low, and medium burn rate categories. Refer to the manufacturer's written instruction (or Loading procedure) for more details about the coal bed raking.

Additionally, based on the information provided, and with the modifications listed below and the caveats set forth at the end, we are approving your request to use a modified version of ASTM E2515-11 when conducting PM emission sampling as required by 40 CFR 60.534(c) including an alternative sampling procedure when conducting first hour PM emission sampling as required by 40 CFR 60.534(d).

When using ASTM E2515-11 to conduct PM sampling as required by 60.534(c), the following changes and modifications must be made:

1. Section 9.2.2 - Modification of requirement:

- a. Tunnel flow rate must be sufficient to maintain tunnel temperature below 125 °F (maximum) and 104 °F on a 10-minute rolling average, excluding periods when the appliance door is open. Two exceedances are allowed of the 10-minute rolling average

points in each test run. The tunnel relative humidity must be below 90% humidity at 80°F (ASTM E2515-11 minimum filter temperature as required in this alternative test method) based on 1-minute data excluding periods when the appliance door is open.

- i. Optionally, real-time tunnel dewpoint temperature measurements recorded at a minimum rate of one reading per minute can be made to override the maximum tunnel temperature requirement (125°F maximum and 104°F on a 10-minute rolling average). One-minute dewpoint temperature measurements in the dilution tunnel must be below the one-minute ASTM E2515-11 filter temperature measurement. If there is an exceedance of the tunnel dewpoint temperature above the ASTM E2515-11 filter temperature, then the test run is invalid and must be repeated.
    - ii. As an alternative to 1.a.i, the tunnel relative humidity may be measured using a psychrometer to measure the wet bulb temperature in the dilution tunnel. These measurements must be taken and recorded, at a minimum of every 2 minutes. ASTM E0377-15 Standard Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry- Bulb Temperatures) may be followed for these purposes.
  - b. With respect to the last sentence in ASTM E2515-11 section 9.2.2, you are excluded from the following requirement: “The maximum tunnel flow rate shall not exceed five times the minimum flow rate determined as shown in 9.2.4.”
2. Sections 9.8.1, 10.2.1 and 11.7 - Additional requirements:
  - a. **The filter temperature must be maintained between 80 and 90 °F during testing.**
  - b. Filters must be weighed in pairs to reduce weighing error propagation; see ASTM E2515-11, section 10.2.1 Analytical Procedure. The gravimetric analysis must be done with each pair of filters, pre and post testing.
  - c. Sample filters must be Pall TX-40 or equivalent Teflon-coated glass fiber, and of 47 mm, 90 mm, 100 mm, or 110 mm in diameter.
  - d. Only one point per sampling train is allowed outside the  $\pm 10$  percent proportionality range per test run.
  - e. **Non-desiccated post-test filter weights must be taken within an hour after the post-test leak check. These initial weights must be included in the test report.**
  - f. Oven drying desiccation, at any temperature, is not allowed.
  - g. Dual train comparison (precision) must be calculated in terms of percent difference between the two sample trains and in terms of calculated emissions difference on a g/kg basis. These values must both be clearly reported for each test run.
  - h. Negative filter weights must be discussed in the test report. Where negative mass (i.e., filter material left on O-rings and gaskets) is subtracted from the overall PM mass, the resultant PM mass must be reported with the mass subtracted and with the mass not subtracted for comparison purposes.
3. Sections 9.5.2 through 11.4.2 - Additional requirement:
  - a. Ambient background sampling and filter collection must be conducted per ASTM E2515-11, section 4.3 and all other method specific room air sampling requirements.

4. Sections 9.6.4 through 9.6.5.1 - Additional requirement:

- a. Particulate matter emission concentrations must be measured with ASTM E2515-11 with the following exceptions, eliminate section 9.6.5.1 of ASTM E2515-11 and perform the post-test leak checks as specified below:
  - i. Post-Test Leak Check: A leak check of each sampling train is mandatory at the conclusion of each sampling run before sample recovery. The leak check must be performed in accordance with the procedures of ASTM E2515-11, section 9.6.4.1, except that it must be conducted at a vacuum equal to or greater than the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.0003 m<sup>3</sup>/min (0.01 cfm) or 4% of the average sampling rate (whichever is less), the leak check results are acceptable. If a higher leakage rate is obtained, the sampling run is invalid.
- b. Additionally, if a component change of either sampling train is needed during sampling, then perform the leak check specified below:
  - i. Leak Checks During Sample Run: If, during a sampling run, a component (e.g., filter assembly) change becomes necessary, a leak check must be conducted immediately before the change is made. Record the sample volume before and after the leak test. The sample volume collected during any leak checks must not be included in the total sample volume for the test run. The leak check must be done according to the procedure outlined in ASTM E2515-11, section 9.6.4.1, except that it must be done at a vacuum equal to or greater than the maximum value recorded up to that point in the sampling run. If the leakage rate is found to be no greater than 0.0003 m<sup>3</sup>/min (0.01 cfm) or 4% of the average sampling rate (whichever is less), the leak check results are acceptable. If a higher leakage rate is obtained, the sampling run is invalid.
- c. NOTE: Immediately after component changes, leak checks are optional but highly recommended. If such leak checks are done, the post-test leak check procedure referenced above shall be used.

When using ASTM E2515-11 to conduct first hour PM sampling as required by 60.534(d), these changes and modifications must be made:

1. To determine the first hour PM emissions as required by 60.534(d), the manufacturer and approved test laboratory must measure the first hour of PM emissions for each test run by sampling with a third, identical and independent sampling train operated concurrently for the first hour of PM paired train compliance testing. The manufacturer and approved test laboratory must report the test results from this third train separately as the first hour emissions. Filters must be recovered and weighed as a paired set.

All other requirements of ASTM E3053-18 and ASTM E2515-11 must be followed during the testing, and all requirements of 40 CFR part 60, Subpart AAA must be satisfied and described in your test report. This approval is based on the understanding that the lowest heat output (Btu/hr) setting on the US1100E Series room heater available to the user will correspond to the lowest burn rate to be evaluated during

certification testing and the test report will fully document that the certification testing was conducted as such. This is consistent with section 60.534(a)(1) of Subpart AAA, which states, "the burn rate for the low burn category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer."

A copy of this letter must be included in any certification test report where this alternative test method determination is utilized.

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

Sincerely,

**STEFFAN  
JOHNSON**

Steffan M. Johnson  
Group Leader  
Measurement Technology Group

Digitally signed by STEFFAN  
JOHNSON  
Date: 2022.11.01 10:33:47  
-04'00'

cc: Angelina Brashear – EPA/OAQPS/AQAD  
Shannon Banner – EPA/OAQPS/SPPD  
James Hemby – EPA/OAQPS/AQAD  
Rafael Sanchez – EPA/OECA  
Bill Schrock - EPA/OAQPS/SPPD  
Robert Scinta – EPA/OECA  
Michael Toney – EPA/OAQPS/AQAD  
Mark Turner – EPA/OAQPS/SPPD  
Chet Wayland – EPA/OAQPS/AQAD







## Loading procedure for 1.7R Series stoves (referring to EPA letter dated 11-01-2022)

- Fuel Specie: Beech
- Fuel length: See ATM, recommended 16 inches.
- UFV: 1.44 ft<sup>3</sup> (see ATM for detail where not to put fuel).

### High burn rate

#### Stove lighting (Kindling & Start-up Fuel):

For Kindling and Start-up fuel configuration refer to the following picture. Split the start-up fuel log into 6 pieces. Crisscross at 45 degrees the 6 pieces on the brick on 3 rows (From the bottom, first row 2 smallest- second row 2 biggest- third row 2 medium) and leaving some space between each wood pieces. Crisscross at 45 degrees the kindling on the top of the start-up fuel on 3 rows, from biggest to smallest. The kindling is made of between 12-15 small pieces that are about 10% of moisture content. Place newspaper sheets on top of the kindling. Light up the paper and let the door **open** between one minute and **three** minutes, then close the door. Air control is fully open.



When there are only faint flames remaining and most of the wood is turned into coal, break ashes and level coal bed. Close the door.





### Pre-load (high fire) configuration:

For optimal loading of a high fire, take small to medium size fuel pieces (between 2- and 3-inches cross section dimensions approximately) on the bottom and use medium to large size fuel pieces (3.5 to 4.5 inches of cross section dimensions approximately) on top. To make sure combustion is equal, put the biggest piece on top of the first three, at the front of the firebox. See example in picture below:

Front



### High fire loading:

Add High Fire load in an East-West configuration. Put 3 first pieces on the coal bed. Leave about 2 inches of air space between the rear firebrick and the first piece. See following picture for example of load inside the firebox. The front (3<sup>rd</sup>) piece should stand off on the steel andirons by approximately 1-2 inches.



The 2 other pieces should be added on top of the first 3, stacked in the middle, in an East-West orientation. Let the door **open** between one minute and **three** minutes **after the loading period**. Close the door, start the blower at maximum speed, and let burn until the weight is down to target.





End of High Fire sampling when 89-91% of the high fire load is consumed.

## Low burn rate

### Load configuration:

For optimal low fire load, use medium to large size fuel pieces (between 4- and 5.5-inches cross section dimensions approximately) on the bottom and use small to medium size fuel pieces (2.5 to 4 inches cross section dimensions approximately) on top. To make sure combustion is equal, put the smallest piece on top of the first three, at the back of the firebox. See pictures below for load example:



### Transition to Low:

After the high fire sampling, if there is visible yellow flame, stir the coal bed.

When the charcoal bed weight is between 14 and 20% of the low fire load weight, turn off the blower, open the door, stir the coals slightly, just enough to have a level plane coal bed, and let the door remain slightly open for 1 minute before loading the low burn test fuel.





### Loading:

For the loading, put 3 first pieces on the coal bed in an East-West orientation. Leave approximately 1 inch of air space between the rear firebrick and the first piece. There should be air space between all pieces. The front (3<sup>rd</sup>) piece may contact the steel andirons.



The 2 top pieces (fourth and fifth) should be added on top of the first 3, slightly angled (10° from the 3 wood pieces at the bottom). The distance between the logs should be approximately 1 inch. Let the door **open** until the flames roll on top of the fuel (between 2:00 and **5:00** minutes **after the loading period**) and then close the door with the primary air control open.



Close the primary air control by small increments (ex: 1/16 of an inch), from ½" to fully closed, between 4 and 15 minutes after the loading period. Before closing further, make sure the flame intensity is increasing or stable. Close the air control completely. Turn ON the blower at maximum speed.

## Medium burn rate

### Load configuration:

For optimal medium fire load, use medium to large size fuel pieces (between 4- and 5.5-inches cross section dimensions approximately) on the bottom and use small to medium size fuel pieces (2.5 to 4 inches cross section dimensions approximately) on top. To make sure combustion is equal, put the smallest piece on top of the first three, at the back of the firebox. See pictures below for load example:

Front



### Transition to Medium Fire:

After the high fire sampling, if there is visible yellow flame, stir the coal bed.

When the charcoal bed weight is between 14 and 20% of the medium fire load weight, turn off the blower, open the door, stir the coals slightly, just enough to have a level plane coal bed, and let the door remain slightly open for 1 minute before loading the medium burn test fuel.





**Loading:**

For the loading, put 3 first pieces on the coal bed in an East-West orientation. Leave about 1 to 2 inches of air space between the rear firebrick and the first piece. The front (3<sup>rd</sup>) piece should stand off from the steel andirons by approximately 1 inch.



The 2 top pieces (fourth and fifth) should be added on top of the first 3, slightly angled (10° from horizontal, top view). The distance between the logs should be approximately 1 inch.



Let the door **open** until the flames roll on top of the fuel (between 2:30 and 5:00 minutes **after the loading period**) and then close the door with the primary air control open. See picture below for rolling flame:



Fabricant de poêles international inc.  
*Stove Builder International Inc.*

2023-06-01



Close the primary air control by small increments (ex: 1/16 of an inch) until reaching the mid-point of air control position, between 4 and 15 minutes after the loading period. Before closing further, make sure the flame intensity is increasing or stable. Turn ON the blower at maximum speed.



## ASTM E2515-2017 dilution tunnel dimensions for Stove Builder International (SBI)

- Address: 250 rue de Copenhagen, Saint-Augustin-de-Desmaures, QC, Canada.
- Test bay ID : “Banc 4”
- No mixing baffles.
- Presence of mixing section

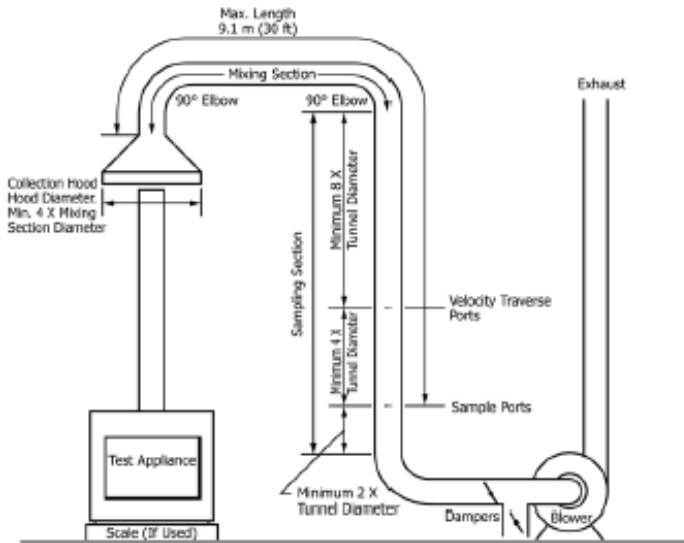


FIG. 3 Steel-Constructed Dilution Tunnel Apparatus

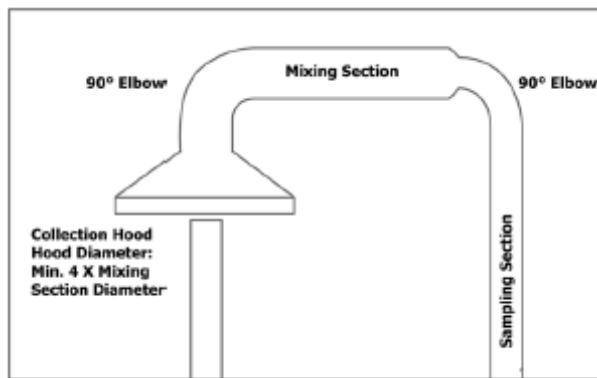


FIG. 4 Mixing Section and Sampling Section with Different Diameters

8-in tunnel:

Collection hood – 48-in (bottom) to 12-in (top) diameter

12 to 10-in reducer after the collection hood

10-in 90° elbow

Mixing section – 10-in diameter, 73-in in length to the reducer.

10 to 8-in reducer

8-in 90° elbow

Sampling section – 8-in diameter, 60-in from elbow to floor, 80-in from floor to traverse ports, 48-in from traverse ports to sample ports.

By-pass allow change range between 150 to 600 scfm approx.

Photos of 8-in tunnel:



Collection Hood



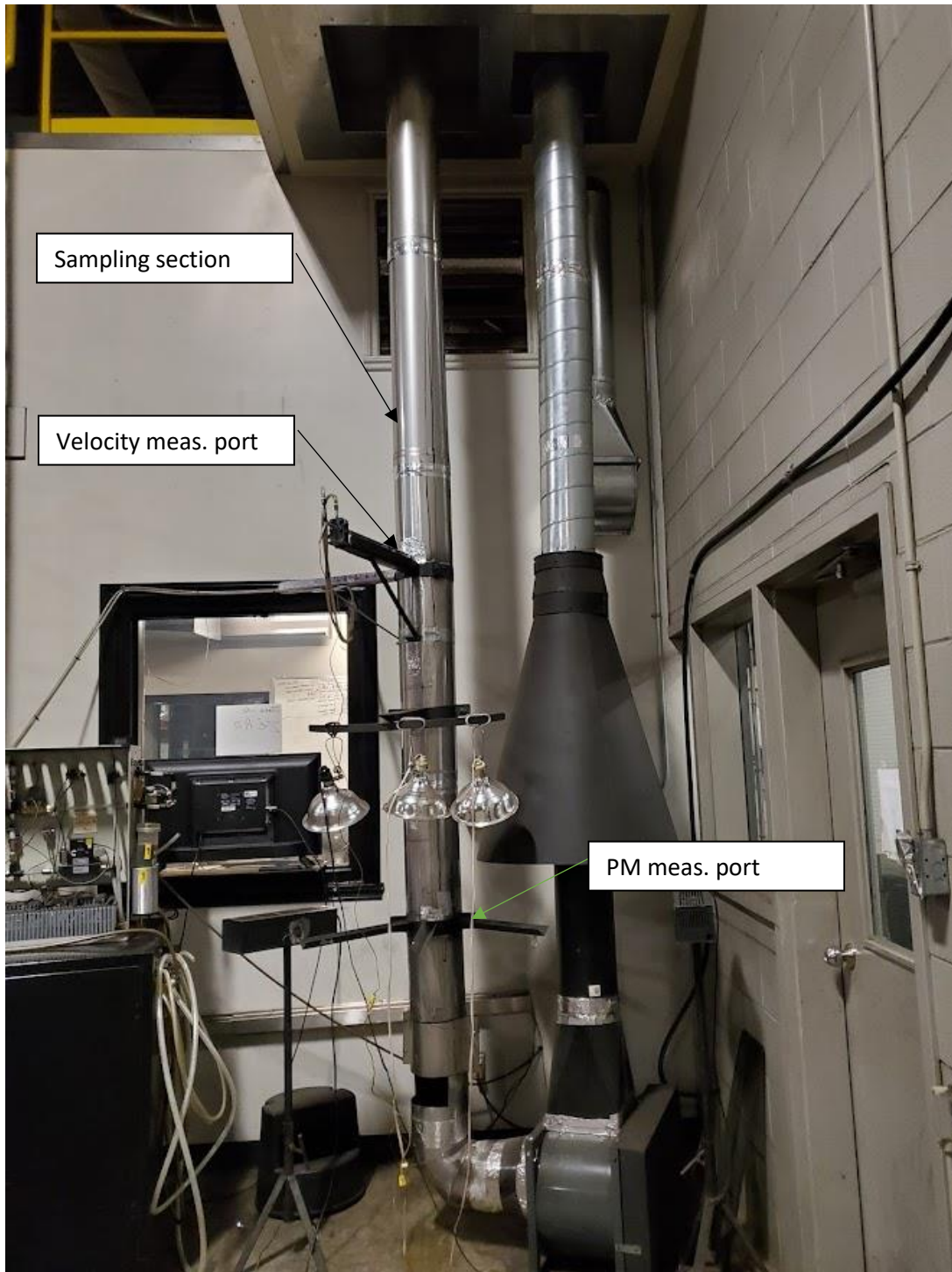
Mixing Section



Sampling Section (elbow to floor)



Sampling Section (elbow to floor)



Traverse and sampling ports

## ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
 Model: 1.7R Run Number: 1&2 Test Date: 6/6/2023

### Wood Heater Run Notes

**High Fire Test Notes**

Test Burn Start Time: 10:08  
 Air Control Setting: High Test Setting - Fully Open

Time	Notes
10:08	Light newspaper on top of kindling with torch (10 seconds) left door open
10:11	Door closed, fan off, air set to high (fully open)
10:43	@ 1.98 lbs, leveled coal bed and loaded high fire test load, door left open
10:46	Closed door, fan turned on to max speed
11:55	Ended test at 3.52 lbs (1.98 lbs coal bed + 1.54 lbs of high fire load) remaining

Test Burn End Time: 11:55

**Low/Medium Fire Test Notes**

Test Burn Start Time: 12:00  
 Air Control Setting: Low Setting - Fully Closed

Time	Notes
12:00	Loaded low fire test load, door left open
12:03	Closed door
12:04	Closed air down to 1/2" from fully open
12:06	Closed air down to 3/8" from fully open
12:09	Closed air down to 1/4" from fully open
12:12	Closed air to test setting, turned fan on to maximum speed
20:28	End of Test

Test Burn End Time: 20:28

### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 18.00 CO (%): 4.35  
 Mid Gas CO<sub>2</sub> (%): 10.10 CO (%): 1.98

**Calibration Results:**

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:18	8:42	8:30	8:35	8:30	8:40
CO <sub>2</sub>	0.00	10.42	18.02	0.08	10.08	17.85
CO	0.00	1.997	4.350	0.025	1.954	4.256

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

Technician Signature: 

Date: 6/7/2023

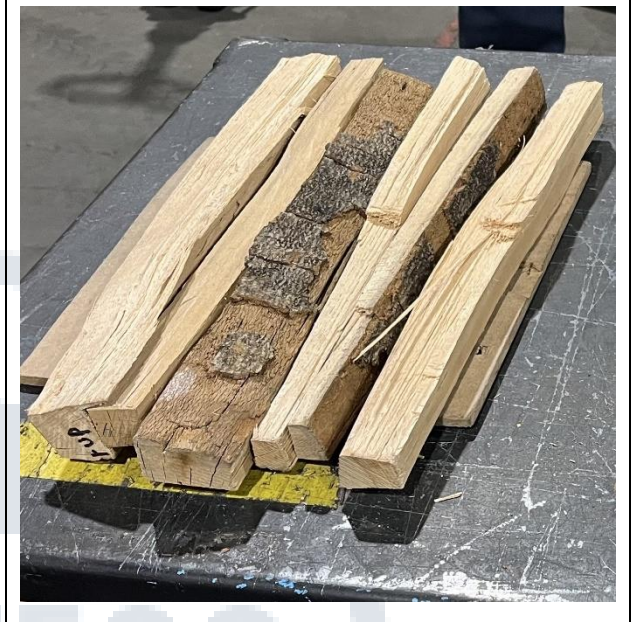
# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 1&2 Test Date: 6/6/2023

## Test Photos



**Kindling Fuel Load**



**Start-up Fuel Load**



**Kindling & Start-up Loaded in Stove**



**High Fire Fuel Load**

Technician Signature: *Sebastian E. Sutton*

Date: 6/7/2023

# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 1&2 Test Date: 6/6/2023



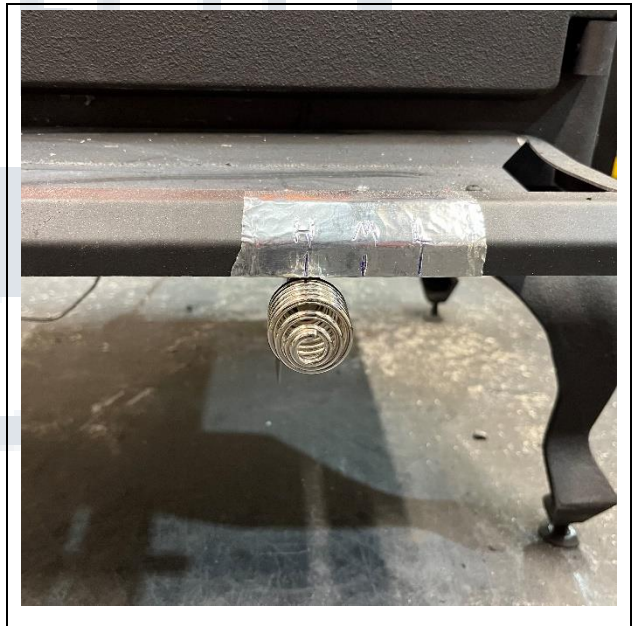
Residual Start-up Fuel Coal Bed – Pre Rake



Residual Start-up Fuel Coal Bed – Post Rake



High Fire Fuel Loaded



Air Setting – High Fire

Technician Signature: *Sebastian E. Collins*

Date: 6/7/2023

# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 1&2 Test Date: 6/6/2023



Residual High Fire Load Coal Bed – Pre Rake



Residual High Fire Load Coal Bed – Post Rake



Low Fire Fuel Load



Low Fire Fuel Loaded

Technician Signature: Sebastian E. Sutton

Date: 6/7/2023



# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 1&2 Test Date: 6/6/2023



**Low Fire Air Setting**



Technician Signature: *Sebastian E. Cotton*

Date: 6/7/2023

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 1 Data Summary**

Client: SBI  
Model: 1.7R  
Job #: 23-161  
Tracking #: 135  
Test Date: 6/6/2023

  
\_\_\_\_\_  
Technician Signature

7/3/2023  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI

Model: 1.7R

Run #: 1

Job #: 23-161

Tracking #: 135

Technician: SJB

Date: 6/6/2023

<b>Burn Rate (kg/hr):</b>	<b>4.07</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	19.806	19.235	18.718	7.134
Average Gas Velocity in Dilution Tunnel (ft/sec)	24.83			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	28383.3			
Average Gas Meter Temperature (°F)	78.3	77.5	76.1	76.5
Total Sample Volume (dscf)	19.325	19.084	18.516	6.915
Average Tunnel Temperature (°F)	100.0			
Total Time of Test (min)	107			
Total Particulate Catch (mg)	0.0	2.2	1.9	1.6
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0001153	0.0001026	0.0002314
Total PM Emissions (g)	0.00	5.84	5.19	6.57
Particulate Emission Rate (g/hr)	0.00	3.27	2.91	6.57
Emissions Factor (g/kg)	-	0.87	0.77	-
Difference from Average Total Particulate Emissions (g)	-	0.32	0.32	-
Difference from Average Total Particulate Emissions (%)	-	5.8%	5.8%	-
Difference from Average Emissions Factor (g/kg)	-	0.05	0.05	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	5.51
Particulate Emission Rate (g/hr)	3.09
Emissions Factor (g/kg)	0.82
HHV Efficiency (%)	68.8%
LHV Efficiency (%)	73.7%
CO Emissions (g/min)	1.71

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 81.7/Max: 87.8	OK
Face Velocity	< 30 ft/min	9.7	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min:69.5/Max:82.9	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 06/06/23  
**Run:** 1  
**Control #:** 23-161  
**Test Duration:** 71  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	68.8%	73.7%
<b>Combustion Efficiency</b>	98.4%	98.4%
<b>Heat Transfer Efficiency</b>	70.0%	75.0%

<b>Output Rate (kJ/h)</b>	53,954	51,181	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	4.17	9.19	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	78,384	74,356	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	4.93	10.87	<b>dry lb</b>
<b>MC wet (%)</b>	17.50		
<b>MC dry (%)</b>	21.21		
<b>Particulate (g )</b>	5.51		
<b>CO (g)</b>	121		
<b>Test Duration (h)</b>	1.18		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.09	1.90
<b>g/kg Dry Fuel</b>	1.12	24.62
<b>g/h</b>	4.66	102.65
<b>g/min</b>	0.08	1.71
<b>lb/MM Btu Output</b>	0.20	4.42

<b>Air/Fuel Ratio (A/F)</b>	10.36
-----------------------------	-------

VERSION:

2.4

4/15/2010

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking # 135  
 Technician: SJB  
 Date: 6/6/2023

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.95  
 Max Allowable Start-up Fuel Weight (lbs): 4.42

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	3.35	In Range	21.7	22.3	15.8	19.9	In Range	2.79	1.27
2	15.75	2.23	In Range	19.7	25.9	24.2	23.3	In Range	1.81	0.82
3	16.00	3.32	In Range	25.9	16.7	23.5	22.0	In Range	2.72	1.24
Core Load Wt. (lbs)		8.90	In Range							

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	2.19	In Range	23.5	14.8	19.1	19.1	In Range	1.84	0.83
2	16.00	3.65	In Range	23.7	23.1	18.2	21.7	In Range	3.00	1.36
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		5.84	In Range							

Total Load Weight (lbs): 14.74 In Range  
 Core Load % of Total Weight: 60% In Range 45-65%  
 Remainder % of Total Weight: 40% In Range 35-55%  
 Total Load % of Target Weight: 102% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.2  
 Total Load Average Moisture Content (%DB): 21.2 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.5  
 Total Test Load Weight (dry basis): 12.16 lbs 5.52 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.90	In Range	10	10	10	10.0	In Range	2.64	1.20

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.35	In Range	18.6	24.9	26.3	23.3	In Range	3.53	1.60

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 1.98 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.3 to 1.62 lb  
 Actual Fuel Load Ending Weight (lb): 1.54 In Range

Total Weight All Fuel Added: 21.99 lbs, wet basis  
 18.33 lbs, dry basis  
 8.31 kg, dry basis

Total Weight All Fuel Burned (dry basis): 14.81 lbs  
 6.72 kg

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1  
 Test Start Time: 10:08  
 Test Type: High Fire

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Recording Interval (min): 1  
 Total Sampling Time (min): 107  
 High Fire Test Load Time (min): 36

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0.0005  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 6/5/2023  
 Test Fuel Scale Audit (kg): 5.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.51	29.45	29.48
Relative Humidity (%)	34.6	35.0	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Platform Scale Audit (kg)	5.0	5.0	

Ambient Sample Volume: 19.806 ft<sup>3</sup>

### Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.000	0.001	cfm @	-5 in. Hg
(B)	0.001	0.001	cfm @	-5 in. Hg
(C)	0.001	0.001	cfm @	-5 in. Hg
(Ambient)	0.000	0.000	cfm @	-5 in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.135	75
2	0.161	75
3	0.161	75
4	0.146	75
5	0.109	75
6	0.153	75
7	0.160	75
8	0.144	75
Center	0.171	75

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 25.64 ft/sec

V<sub>scent</sub>: 27.79 ft/sec

F<sub>p</sub>: 0.923 [ratio]

Initial Tunnel Flow: 511.7 scf/min

Static Pressure: -0.328 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI \_\_\_\_\_  
Model: 1.7R \_\_\_\_\_  
Run #: 1 \_\_\_\_\_

Job #: 23-161 \_\_\_\_\_  
Tracking #: 135 \_\_\_\_\_  
Technician: SJB \_\_\_\_\_  
Date: 6/6/2023 \_\_\_\_\_

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

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	314.527		0.159	1.01	76.4	0.00		7.30		75.6	75.3	87.3	69.5
1			0.157	1.02	77.0	0.71	-	7.21	-0.08	78.6	112.3	86.7	70.8
2			0.158	1.05	77.1	0.73	-	7.13	-0.09	80.6	138.5	86.1	71.7
3			0.157	0.99	77.2	0.76	-	7.03	-0.10	84.0	172.1	85.7	72.3
4			0.158	1.01	77.2	0.79	-	6.85	-0.18	81.2	232.3	85.0	72.8
5			0.156	0.99	77.2	0.79	-	6.71	-0.14	81.5	290.2	84.4	73.1
6			0.156	0.96	77.2	0.79	-	6.53	-0.18	83.6	361.2	84.1	73.7
7			0.157	0.93	77.2	0.82	-	6.32	-0.21	85.8	421.7	83.8	74.2
8			0.155	0.91	77.2	0.82	-	6.11	-0.21	87.5	464.6	83.6	74.5
9			0.156	0.91	77.3	0.83	-	5.92	-0.19	88.6	487.7	83.5	74.0
10	316.340	0.181	0.155	0.86	77.3	0.85	98	5.75	-0.17	89.1	496.8	83.4	73.1
11			0.155	0.80	77.3	0.86	-	5.57	-0.18	89.5	502.1	83.2	72.5
12			0.155	0.80	77.3	0.87	-	5.44	-0.14	89.3	493.8	82.9	72.4
13			0.155	0.90	77.3	0.87	-	5.31	-0.13	88.8	477.7	82.6	72.2
14			0.155	0.70	77.4	0.87	-	5.18	-0.13	88.2	468.3	82.4	72.2
15			0.155	0.77	77.4	0.87	-	5.04	-0.14	88.1	458.9	82.1	73.8
16			0.155	0.72	77.4	0.88	-	4.84	-0.21	90.3	490.6	82.1	75.1
17			0.154	0.73	77.4	0.88	-	4.67	-0.16	90.9	499.3	82.0	76.2
18			0.155	0.71	77.4	0.87	-	4.50	-0.17	91.6	502.6	82.2	77.0
19			0.153	0.71	77.4	0.85	-	4.32	-0.18	92.4	513.1	83.0	77.6
20	318.118	0.178	0.153	0.72	77.4	0.88	98	4.16	-0.16	92.9	519.9	83.9	77.4
21			0.154	0.71	77.4	0.87	-	3.99	-0.16	92.8	521.0	84.6	76.5
22			0.153	0.73	77.4	0.91	-	3.84	-0.15	92.9	520.3	85.3	75.8
23			0.155	0.76	77.4	0.91	-	3.66	-0.18	92.9	519.9	85.9	74.9
24			0.155	0.74	77.4	0.89	-	3.51	-0.15	92.9	519.8	86.4	74.5
25			0.154	0.74	77.4	0.89	-	3.38	-0.14	93.0	522.0	86.9	74.4
26			0.154	0.75	77.4	0.89	-	3.18	-0.20	93.2	526.6	87.4	74.1
27			0.155	0.76	77.3	0.90	-	3.03	-0.15	93.4	531.3	87.8	73.9
28			0.153	0.76	77.3	0.89	-	2.88	-0.15	93.5	533.1	87.6	73.7
29			0.154	0.79	77.4	0.89	-	2.73	-0.16	93.0	524.6	87.0	73.6
30	319.912	0.179	0.155	0.80	77.4	0.89	99	2.60	-0.12	93.0	519.1	86.6	73.3
31			0.155	0.82	77.4	0.89	-	2.48	-0.12	92.9	515.7	86.2	73.7
32			0.154	0.81	77.4	0.88	-	2.37	-0.11	92.5	511.1	85.8	73.7



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.156	0.84	77.3	0.88	-	2.25	-0.12	92.1	505.9	85.4	74.0
34			0.155	0.85	77.3	0.89	-	2.13	-0.12	91.9	502.0	85.0	73.6
35			0.155	0.84	77.3	0.90	-	1.99	-0.14	91.9	498.6	84.6	75.0
36			0.148	0.86	77.2	0.91	-	16.70	14.71	119.4	491.8	86.3	77.4
37			0.148	0.83	77.2	0.93	-	16.53	-0.17	122.0	452.3	87.1	77.8
38			0.145	0.86	77.2	0.94	-	16.32	-0.22	129.7	483.7	87.8	78.7
39			0.151	0.84	77.2	0.94	-	16.13	-0.18	107.3	510.1	86.5	79.1
40	321.722	0.181	0.153	0.86	77.2	0.93	100	16.00	-0.14	101.1	510.6	85.6	78.6
41			0.153	0.89	77.3	0.93	-	15.86	-0.14	98.7	514.0	85.2	78.6
42			0.153	0.87	77.2	0.92	-	15.71	-0.14	97.4	522.9	84.9	79.4
43			0.153	0.87	77.2	0.93	-	15.54	-0.17	97.3	530.4	84.6	80.7
44			0.153	0.88	77.3	0.93	-	15.38	-0.15	96.8	525.8	84.3	82.0
45			0.153	0.90	77.3	0.92	-	15.24	-0.14	98.7	521.8	84.2	82.0
46			0.153	0.88	77.3	0.92	-	15.09	-0.15	98.8	518.6	84.2	82.0
47			0.153	0.89	77.3	0.92	-	14.96	-0.14	99.0	516.6	84.1	82.9
48			0.152	0.89	77.3	0.92	-	14.79	-0.16	100.3	520.8	84.1	82.4
49			0.153	0.92	77.3	0.93	-	14.62	-0.17	101.5	530.7	84.2	82.1
50	323.528	0.181	0.151	0.90	77.3	0.93	101	14.44	-0.19	102.7	545.9	84.4	82.7
51			0.152	0.89	77.3	0.93	-	14.24	-0.19	104.1	564.4	84.7	82.7
52			0.152	0.90	77.4	0.93	-	14.03	-0.21	105.4	579.1	84.9	82.8
53			0.151	0.90	77.4	0.91	-	13.84	-0.19	105.6	588.8	84.9	81.4
54			0.151	0.91	77.3	0.92	-	13.66	-0.18	105.0	592.0	84.9	81.2
55			0.152	0.94	77.4	0.93	-	13.44	-0.22	104.8	592.7	84.9	80.8
56			0.152	0.92	77.4	0.94	-	13.23	-0.21	104.0	591.8	84.8	81.2
57			0.153	0.95	77.4	0.93	-	13.05	-0.18	102.8	586.8	84.7	81.0
58			0.152	0.97	77.4	0.95	-	12.86	-0.20	102.0	582.8	84.5	80.8
59			0.152	0.98	77.4	0.95	-	12.67	-0.19	101.7	581.9	84.4	81.0
60	325.320	0.179	0.152	0.97	77.4	0.96	100	12.48	-0.19	101.6	581.7	84.3	80.8
61			0.152	0.96	77.4	0.94	-	12.28	-0.20	101.6	585.8	84.3	80.7
62			0.153	0.96	77.4	0.96	-	12.08	-0.20	101.9	591.7	84.2	80.4
63			0.153	0.99	77.4	0.96	-	11.87	-0.21	102.0	597.9	84.2	80.7
64			0.152	0.96	77.4	0.97	-	11.66	-0.21	102.3	604.2	84.3	80.6
65			0.152	0.97	77.4	0.98	-	11.43	-0.22	102.5	608.1	84.3	80.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.152	0.97	77.4	0.98	-	11.21	-0.22	102.8	613.5	84.4	80.3
67			0.153	0.98	77.5	0.98	-	10.99	-0.22	103.1	618.4	84.4	80.3
68			0.153	0.97	77.5	0.97	-	10.76	-0.23	103.2	622.6	84.4	80.6
69			0.154	0.99	77.5	0.98	-	10.55	-0.21	103.3	625.9	84.4	80.3
70	327.122	0.180	0.152	0.99	77.6	0.98	101	10.33	-0.22	103.5	627.4	84.4	80.3
71			0.153	1.02	77.6	0.97	-	10.10	-0.23	103.8	629.4	84.5	80.2
72			0.152	0.99	77.6	0.98	-	9.88	-0.22	103.9	631.7	84.5	80.5
73			0.154	1.01	77.6	0.98	-	9.65	-0.23	104.0	635.6	84.6	80.2
74			0.153	1.01	77.6	0.97	-	9.42	-0.23	104.2	641.0	84.6	80.3
75			0.152	1.05	77.7	0.98	-	9.20	-0.22	104.8	646.3	84.6	80.3
76			0.153	1.06	77.7	0.98	-	8.96	-0.23	105.0	653.2	84.6	80.0
77			0.151	1.06	77.7	0.97	-	8.74	-0.23	105.6	663.5	84.7	80.2
78			0.152	1.08	77.7	0.99	-	8.50	-0.24	106.4	675.3	84.8	80.7
79			0.152	1.10	77.7	1.00	-	8.25	-0.24	107.2	689.2	84.9	80.5
80	328.916	0.179	0.151	1.12	77.7	1.01	101	8.00	-0.26	107.7	698.6	84.9	80.6
81			0.152	1.11	77.8	1.02	-	7.75	-0.24	108.2	706.7	85.0	80.3
82			0.153	1.10	77.8	1.04	-	7.51	-0.24	108.4	712.6	85.1	80.4
83			0.151	1.13	77.8	1.06	-	7.27	-0.24	108.8	717.8	85.2	80.1
84			0.151	1.13	77.8	1.05	-	7.02	-0.25	108.6	721.0	85.2	79.7
85			0.151	1.14	77.8	1.04	-	6.77	-0.25	108.8	722.1	85.2	79.6
86			0.152	1.15	77.9	1.05	-	6.54	-0.23	108.7	719.1	85.3	79.7
87			0.153	1.17	77.8	1.06	-	6.31	-0.23	108.4	715.1	85.3	79.5
88			0.152	1.19	77.9	1.09	-	6.11	-0.20	108.3	710.0	85.3	79.5
89			0.151	1.19	77.9	1.09	-	5.90	-0.21	108.2	706.9	85.3	79.4
90	330.711	0.180	0.152	1.19	77.9	1.10	101	5.70	-0.21	108.1	705.7	85.3	79.6
91			0.152	1.20	77.9	1.11	-	5.48	-0.22	107.9	702.6	85.4	79.7
92			0.151	1.21	77.9	1.12	-	5.28	-0.20	107.7	701.2	85.4	80.0
93			0.152	1.22	77.9	1.13	-	5.09	-0.19	107.5	699.2	85.4	80.1
94			0.152	1.23	77.9	1.14	-	4.91	-0.18	107.2	689.7	85.4	80.1
95			0.151	1.23	77.9	1.12	-	4.76	-0.15	106.5	677.0	85.3	80.0
96			0.152	1.22	77.9	1.13	-	4.59	-0.16	105.6	661.8	85.2	80.1
97			0.153	1.23	78.0	1.14	-	4.47	-0.12	104.7	649.1	85.1	79.9
98			0.153	1.22	77.9	1.14	-	4.35	-0.12	104.3	637.0	85.0	80.0

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.154	1.25	77.9	1.14	-	4.22	-0.13	106.6	628.8	85.1	80.2
100	332.506	0.179	0.151	1.27	77.9	1.14	101	4.10	-0.11	108.3	622.5	85.3	80.7
101			0.151	1.24	77.9	1.15	-	3.98	-0.12	108.8	614.3	85.4	81.1
102			0.151	1.25	78.0	1.14	-	3.88	-0.10	108.5	602.1	85.5	80.6
103			0.151	1.24	78.0	1.14	-	3.79	-0.09	108.3	591.9	85.5	81.5
104			0.151	1.23	78.0	1.15	-	3.71	-0.08	108.0	583.3	85.5	81.4
105			0.151	1.28	78.0	1.15	-	3.64	-0.08	107.6	571.6	85.5	81.0
106			0.153	1.26	78.0	1.16	-	3.58	-0.05	107.2	560.9	85.5	81.3
107	333.762	0.179	0.152	1.24	78.1	1.17	101	3.52	-0.06	106.5	550.3	85.3	80.9
Avg/Tot	19.235	0.180	0.153	0.97	77.5	0.95	100			100.0	555.8	84.9	78.3

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	392.285		0.26	75.7	0.00		85.8	0.000	0.09	0.008	37.4	47.1
1			0.25	75.9	0.71	-	84.7	0.023	1.43	0.057	37.9	50.4
2			0.28	75.9	0.57	-	84.7	0.030	1.51	0.049	37.0	51.1
3			0.27	76.0	0.57	-	84.5	0.043	1.65	0.036	36.0	52.9
4			0.27	76.0	0.64	-	84.2	0.051	6.63	0.113	38.2	52.2
5			0.28	76.0	0.74	-	83.7	0.061	7.20	0.098	40.7	54.5
6			0.28	76.0	0.75	-	83.5	0.070	9.11	0.176	41.2	56.8
7			0.28	76.0	0.63	-	83.2	0.076	10.30	0.364	40.6	58.3
8			0.27	76.0	0.68	-	83.3	0.077	11.15	0.520	39.3	59.0
9			0.28	76.0	0.74	-	83.5	0.078	10.64	0.316	37.7	58.6
10	394.054	0.177	0.29	76.0	0.75	98	83.7	0.079	9.80	0.197	36.5	58.1
11			0.31	76.0	0.73	-	83.5	0.078	10.13	0.194	35.6	58.1
12			0.31	76.0	0.81	-	83.4	0.076	8.86	0.117	34.7	57.2
13			0.31	76.0	0.77	-	83.1	0.075	7.83	0.151	34.4	56.3
14			0.33	76.0	0.69	-	82.9	0.074	7.88	0.163	34.7	56.1
15			0.32	76.0	0.81	-	82.5	0.074	7.44	0.224	34.6	55.9
16			0.33	76.0	0.69	-	82.5	0.081	10.29	0.120	36.0	59.0
17			0.34	76.0	0.79	-	82.6	0.079	9.99	0.094	34.5	58.1
18			0.34	75.9	0.77	-	82.3	0.078	9.75	0.067	34.0	58.3
19			0.35	76.0	0.79	-	82.5	0.081	10.54	0.062	33.8	59.0
20	395.777	0.172	0.36	76.0	0.69	97	82.6	0.081	10.77	0.093	33.2	58.8
21			0.38	75.9	0.71	-	82.6	0.081	10.64	0.084	33.0	58.6
22			0.39	75.9	0.75	-	82.7	0.080	10.25	0.061	32.6	58.5
23			0.37	75.9	0.73	-	82.6	0.080	10.05	0.083	32.4	58.3
24			0.38	75.9	0.80	-	82.7	0.081	9.93	0.067	32.2	58.1
25			0.36	75.9	0.79	-	82.5	0.082	9.96	0.058	32.0	57.9
26			0.38	75.9	0.76	-	82.6	0.082	10.42	0.079	32.0	58.3
27			0.38	75.9	0.70	-	82.7	0.083	10.53	0.048	31.9	58.3
28			0.33	75.9	0.76	-	82.6	0.081	10.87	0.109	31.7	58.3
29			0.31	75.9	0.76	-	82.5	0.080	9.74	0.086	30.9	57.0
30	397.520	0.174	0.33	75.9	0.79	99	82.3	0.080	9.44	0.058	30.6	56.8
31			0.35	75.9	0.73	-	82.2	0.079	9.37	0.036	30.5	56.5
32			0.32	75.8	0.79	-	82.3	0.079	9.36	0.042	30.5	56.3
33			0.31	75.8	0.78	-	82.0	0.078	8.95	0.055	30.6	55.9
34			0.28	75.8	0.81	-	81.8	0.078	8.90	0.045	30.4	55.8
35			0.27	75.8	0.71	-	81.7	0.078	8.51	0.109	30.3	55.4
36			0.29	75.8	0.79	-	83.4	0.079	4.85	0.128	29.2	58.3
37			0.26	75.8	0.78	-	84.3	0.081	2.63	0.097	29.2	58.3
38			0.29	75.8	0.75	-	85.2	0.093	3.32	0.077	29.2	58.3

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.26	75.8	0.77	-	84.5	0.081	9.36	0.169	24.9	61.5
40	399.274	0.175	0.27	75.8	0.75	100	83.9	0.082	8.10	0.153	26.5	59.9
41			0.30	75.8	0.78	-	83.6	0.082	8.25	0.108	27.6	59.4
42			0.26	75.9	0.85	-	83.3	0.083	8.62	0.105	29.4	59.4
43			0.26	75.8	0.84	-	83.1	0.082	9.11	0.125	29.4	59.4
44			0.23	75.8	0.77	-	83.0	0.082	8.16	0.120	29.0	58.6
45			0.29	75.8	0.77	-	83.0	0.081	7.84	0.144	28.1	59.0
46			0.27	75.8	0.73	-	83.0	0.081	7.98	0.143	27.8	59.0
47			0.27	75.8	0.81	-	83.1	0.082	8.12	0.153	27.8	59.2
48			0.25	75.8	0.80	-	83.3	0.083	8.86	0.159	27.6	59.9
49			0.21	75.8	0.80	-	83.7	0.084	9.50	0.155	27.3	60.6
50	401.032	0.176	0.23	75.9	0.83	101	84.2	0.085	10.02	0.146	26.9	61.2
51			0.23	75.9	0.77	-	84.6	0.088	10.72	0.153	26.5	62.1
52			0.21	75.9	0.76	-	84.9	0.089	11.48	0.180	25.9	62.4
53			0.25	75.9	0.85	-	84.9	0.089	11.38	0.160	25.7	62.4
54			0.22	75.9	0.76	-	84.9	0.089	11.51	0.205	26.0	62.4
55			0.21	75.9	0.79	-	84.8	0.090	11.52	0.397	26.6	62.8
56			0.20	75.9	0.82	-	84.6	0.088	11.99	0.328	26.9	62.6
57			0.22	75.9	0.80	-	84.6	0.087	11.18	0.194	27.2	61.9
58			0.23	75.9	0.76	-	84.5	0.087	10.86	0.179	27.5	61.5
59			0.22	75.9	0.84	-	84.3	0.087	10.82	0.188	27.8	61.5
60	402.781	0.175	0.22	75.9	0.76	101	84.1	0.087	11.05	0.172	28.1	61.7
61			0.22	75.9	0.78	-	84.2	0.088	11.40	0.182	28.3	61.9
62			0.23	75.9	0.76	-	84.1	0.089	11.76	0.257	28.4	62.2
63			0.21	75.9	0.85	-	84.1	0.090	12.03	0.289	28.4	62.4
64			0.24	75.9	0.86	-	84.2	0.090	12.22	0.333	28.4	62.6
65			0.23	75.9	0.86	-	84.1	0.090	12.31	0.352	28.3	62.6
66			0.23	75.9	0.79	-	84.2	0.091	12.52	0.388	28.4	63.0
67			0.23	76.0	0.87	-	84.3	0.091	12.84	0.358	28.3	63.1
68			0.24	76.1	0.77	-	84.3	0.091	12.98	0.365	28.2	63.1
69			0.25	76.1	0.87	-	84.2	0.092	13.04	0.330	28.1	63.1
70	404.535	0.175	0.23	76.1	0.85	101	84.3	0.092	13.04	0.287	27.9	63.1
71			0.24	76.2	0.79	-	84.4	0.092	13.04	0.286	27.7	63.1
72			0.25	76.2	0.87	-	84.3	0.091	13.14	0.270	27.6	63.1
73			0.26	76.2	0.81	-	84.3	0.093	13.26	0.278	27.6	63.1
74			0.26	76.2	0.81	-	84.3	0.093	13.50	0.276	27.6	63.3
75			0.26	76.2	0.79	-	84.4	0.093	13.70	0.271	27.2	63.5
76			0.26	76.2	0.82	-	84.3	0.095	13.85	0.291	27.0	63.5
77			0.27	76.2	0.89	-	84.4	0.095	14.25	0.330	26.9	63.9

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.28	76.2	0.88	-	84.5	0.096	14.60	0.441	26.5	64.0
79			0.29	76.3	0.80	-	84.6	0.096	15.02	0.464	26.2	64.4
80	406.284	0.175	0.30	76.3	0.80	101	84.7	0.098	15.20	0.498	25.9	64.4
81			0.28	76.3	0.88	-	84.8	0.098	15.25	0.539	25.5	64.4
82			0.30	76.3	0.89	-	84.8	0.099	15.36	0.540	25.3	64.4
83			0.27	76.3	0.89	-	84.9	0.099	15.39	0.542	24.9	64.2
84			0.30	76.4	0.90	-	85.0	0.098	15.41	0.531	24.8	64.0
85			0.31	76.4	0.92	-	84.9	0.098	15.37	0.526	24.7	64.0
86			0.31	76.4	0.94	-	84.9	0.098	15.17	0.499	24.5	63.7
87			0.30	76.4	0.92	-	84.9	0.098	15.05	0.433	24.4	63.3
88			0.30	76.4	0.96	-	84.9	0.097	14.84	0.424	24.3	63.0
89			0.30	76.4	0.96	-	84.9	0.097	14.73	0.394	24.2	62.8
90	408.021	0.174	0.30	76.4	0.88	100	84.9	0.097	14.70	0.397	24.1	62.8
91			0.30	76.4	0.95	-	84.9	0.096	14.62	0.349	23.9	62.4
92			0.33	76.5	0.96	-	84.8	0.096	14.47	0.341	23.8	62.1
93			0.30	76.4	1.01	-	84.8	0.096	14.37	0.322	23.8	61.9
94			0.29	76.4	0.95	-	84.9	0.095	13.87	0.256	23.6	61.2
95			0.30	76.5	1.02	-	84.8	0.094	13.14	0.221	23.3	60.4
96			0.32	76.5	1.00	-	84.8	0.093	12.47	0.193	23.2	59.7
97			0.34	76.5	0.93	-	84.6	0.092	11.66	0.119	23.2	59.0
98			0.33	76.5	0.95	-	84.5	0.090	11.13	0.105	23.3	58.5
99			0.34	76.5	0.93	-	84.5	0.089	11.00	0.101	21.9	58.8
100	409.774	0.175	0.35	76.5	0.97	101	84.7	0.089	11.00	0.096	21.1	59.2
101			0.36	76.5	0.99	-	84.8	0.088	10.72	0.080	20.8	59.0
102			0.35	76.5	1.03	-	84.8	0.086	9.86	0.050	20.5	58.5
103			0.31	76.5	0.99	-	85.0	0.086	9.32	0.035	20.3	58.1
104			0.35	76.6	0.93	-	85.0	0.085	9.00	0.028	20.2	57.7
105			0.33	76.6	0.93	-	85.0	0.083	8.39	0.027	20.1	57.2
106			0.35	76.6	0.93	-	85.0	0.082	7.96	0.030	19.9	56.7
107	411.003	0.176	0.35	76.6	1.03	101	84.9	0.082	7.68	0.032	19.9	56.1
Avg/Tot	18.718	0.175	0.29	76.1	0.81	100	83.9	0.084	10.58	0.205	28.70	59.775

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 1

Technician: SJB

Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data						
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	188.046		0.40	75.9	1.00		81.8
1			0.40	76.0	1.00	-	82.9
2			0.40	76.0	1.00	-	84.2
3			0.40	76.1	1.00	-	83.7
4			0.40	76.1	1.00	-	83.3
5			0.40	76.1	1.00	-	82.9
6			0.40	76.1	1.00	-	82.6
7			0.40	76.1	1.00	-	82.4
8			0.40	76.1	1.00	-	83.2
9			0.40	76.1	1.00	-	84.7
10	189.223	0.118	0.40	76.2	1.00	96	85.9
11			0.40	76.2	1.00	-	85.2
12			0.40	76.2	1.00	-	84.6
13			0.40	76.2	1.00	-	84.1
14			0.40	76.2	1.00	-	83.7
15			0.40	76.2	1.00	-	83.5
16			0.40	76.3	1.00	-	83.2
17			0.40	76.3	1.00	-	82.9
18			0.40	76.3	1.00	-	82.9
19			0.40	76.3	1.00	-	83.0
20	190.393	0.117	0.40	76.3	1.00	97	83.0
21			0.40	76.3	1.00	-	83.0
22			0.40	76.4	1.00	-	83.1
23			0.40	76.4	1.00	-	83.2
24			0.40	76.4	1.00	-	83.3
25			0.40	76.4	1.00	-	83.4
26			0.40	76.4	1.00	-	83.4
27			0.40	76.4	1.00	-	83.5
28			0.40	76.4	1.00	-	83.4
29			0.40	76.5	1.00	-	83.3
30	191.575	0.118	0.40	76.5	1.00	98	83.1
31			0.40	76.5	1.00	-	83.0

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 1

Technician: SJB

Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data						
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.40	76.5	1.00	-	82.9
33			0.40	76.5	1.00	-	82.8
34			0.40	76.5	1.00	-	82.6
35			0.40	76.5	1.00	-	82.5
36			0.40	76.5	1.00	-	82.5
37			0.40	76.5	1.00	-	82.4
38			0.40	76.5	1.00	-	82.4
39			0.40	76.6	1.00	-	82.4
40	192.836	0.126	0.40	76.6	1.00	105	82.4
41			0.40	76.6	1.00	-	82.4
42			0.40	76.7	1.00	-	82.4
43			0.40	76.7	1.00	-	82.3
44			0.40	76.7	1.00	-	82.2
45			0.40	76.7	1.00	-	82.1
46			0.40	76.7	1.00	-	82.1
47			0.40	76.7	1.00	-	82.0
48			0.40	76.7	1.00	-	83.0
49			0.40	76.7	1.00	-	84.4
50	194.038	0.120	0.40	76.8	1.00	101	85.7
51			0.40	76.9	1.00	-	86.8
52			0.40	76.9	1.00	-	86.8
53			0.40	76.9	1.00	-	86.2
54			0.40	76.9	1.00	-	85.8
55			0.40	77.0	1.00	-	85.4
56			0.40	77.0	1.00	-	85.2
57			0.40	77.0	1.00	-	84.9
58			0.40	77.0	1.00	-	84.7
59			0.40	77.0	1.00	-	84.5
60	195.180	0.114	0.40	77.0	1.00	97	84.2
Avg/Tot	7.134	0.119	0.40	76.5	1.00	99	83.5



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
0	76.2	77.2	78.7	76.9	76.6	77.1	N/A	
1	83.6	77.0	78.6	76.8	76.5	78.5	N/A	
2	93.1	77.0	79.1	76.8	76.5	80.5	N/A	
3	103.8	77.0	80.6	76.9	76.7	83.0	N/A	
4	125.8	76.9	82.9	77.3	77.2	88.0	N/A	
5	161.6	76.8	86.3	78.2	78.1	96.2	N/A	
6	222.6	76.8	90.8	79.7	79.3	109.8	N/A	
7	294.5	76.9	96.6	81.7	80.9	126.1	N/A	
8	365.9	77.0	103.8	84.4	83.0	142.8	N/A	
9	424.6	77.2	111.8	87.8	85.6	157.4	N/A	
10	473.5	77.5	119.9	91.6	88.8	170.3	N/A	
11	514.1	77.9	127.8	95.9	92.4	181.6	N/A	
12	538.5	78.5	135.5	100.7	96.4	189.9	N/A	
13	544.6	79.2	142.9	105.8	100.7	194.7	N/A	
14	540.9	80.4	149.9	111.1	105.4	197.5	N/A	
15	535.5	81.8	156.4	116.6	110.3	200.1	N/A	
16	540.0	83.6	162.6	122.2	115.5	204.8	N/A	
17	554.6	85.7	169.0	127.8	120.8	211.6	N/A	
18	565.0	88.3	176.1	132.9	126.3	217.7	N/A	
19	574.4	91.3	183.8	138.1	131.9	223.9	N/A	
20	584.5	94.5	192.1	143.0	137.8	230.4	N/A	
21	596.3	98.0	200.3	148.5	144.0	237.4	N/A	
22	604.2	101.6	208.1	154.3	150.3	243.7	N/A	
23	610.5	105.4	215.4	160.3	157.1	249.7	N/A	
24	615.8	109.4	222.3	166.3	163.9	255.6	N/A	
25	622.1	113.5	229.0	172.3	170.8	261.6	N/A	
26	627.4	117.7	235.8	178.3	177.6	267.4	N/A	
27	633.1	121.9	242.5	184.5	184.5	273.3	N/A	
28	639.6	126.2	249.4	190.6	191.9	279.5	N/A	
29	643.9	130.6	256.5	196.9	199.5	285.5	N/A	
30	645.4	134.9	263.7	203.1	206.9	290.8	N/A	
31	644.7	139.4	271.2	209.3	214.3	295.8	N/A	
32	643.0	143.8	278.7	215.8	221.4	300.5	N/A	
33	639.3	148.3	286.0	221.9	228.5	304.8	N/A	
34	635.5	152.7	292.6	227.6	235.2	308.7	N/A	
35	632.9	156.9	298.9	234.1	241.7	312.9	N/A	
36	625.1	162.0	306.1	242.2	249.4	316.9	N/A	
37	601.1	167.2	314.4	249.5	256.5	317.7	N/A	
38	585.6	172.6	320.8	256.8	263.4	319.9	N/A	
39	589.9	177.4	325.2	262.6	269.2	324.9	N/A	
40	601.0	181.9	326.9	267.8	275.0	330.5	N/A	
41	611.7	185.8	326.7	271.9	279.9	335.2	N/A	
42	621.9	189.3	325.5	276.4	284.7	339.6	N/A	
43	632.3	192.8	323.6	279.7	289.1	343.5	N/A	
44	639.2	196.1	321.8	282.2	293.3	346.5	N/A	
45	640.8	199.2	319.5	283.9	296.7	348.0	N/A	
46	643.9	202.3	317.1	285.2	300.4	349.8	N/A	
47	643.4	205.1	315.2	286.2	303.6	350.7	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
48	645.3	208.0	313.6	286.7	306.3	352.0	N/A	
49	652.3	210.7	312.8	287.1	308.8	354.3	N/A	
50	662.1	213.2	313.2	287.4	311.0	357.4	N/A	
51	676.0	215.7	314.7	287.7	313.1	361.4	N/A	
52	691.0	217.9	317.0	287.5	315.2	365.7	N/A	
53	705.0	219.9	319.8	286.6	317.2	369.7	N/A	
54	718.2	221.0	323.0	285.7	318.2	373.2	N/A	
55	725.5	222.7	326.8	285.5	320.3	376.2	N/A	
56	730.9	224.7	330.4	284.9	322.5	378.7	N/A	
57	734.8	226.3	333.4	285.3	324.9	380.9	N/A	
58	733.6	228.1	335.8	286.2	327.8	382.3	N/A	
59	731.3	229.9	338.0	287.1	330.8	383.4	N/A	
60	729.5	232.3	340.2	288.6	333.6	384.8	N/A	
61	729.6	234.3	342.5	289.8	336.4	386.5	N/A	
62	733.3	236.5	345.3	291.5	339.1	389.1	N/A	
63	740.2	238.8	348.4	293.2	341.7	392.5	N/A	
64	747.0	241.3	352.0	295.2	344.5	396.0	N/A	
65	753.0	243.6	355.9	297.2	346.8	399.3	N/A	
66	757.7	245.8	359.9	299.1	349.8	402.5	N/A	
67	763.1	248.3	364.1	301.1	352.7	405.9	N/A	
68	768.0	250.7	368.3	303.5	355.7	409.2	N/A	
69	772.5	253.1	372.5	306.0	358.7	412.5	N/A	
70	776.9	255.7	376.7	309.2	361.5	416.0	N/A	
71	780.8	258.4	381.0	311.9	364.5	419.3	N/A	
72	782.8	261.1	385.1	315.3	367.4	422.4	N/A	
73	786.8	263.9	389.2	318.9	370.0	425.8	N/A	
74	791.1	266.3	393.4	322.5	372.7	429.2	N/A	
75	796.9	269.7	397.4	326.4	375.5	433.2	N/A	
76	803.4	272.1	401.3	330.1	378.0	437.0	N/A	
77	810.7	275.0	405.4	333.8	380.2	441.0	N/A	
78	819.2	278.0	409.6	337.6	382.7	445.4	N/A	
79	829.2	280.9	413.7	341.4	384.8	450.0	N/A	
80	838.5	284.0	417.8	345.1	387.0	454.5	N/A	
81	846.8	286.9	422.1	349.1	389.3	458.9	N/A	
82	856.2	289.9	426.7	352.8	391.2	463.4	N/A	
83	864.5	292.7	431.2	356.7	393.4	467.7	N/A	
84	871.7	295.7	435.9	360.4	395.5	471.8	N/A	
85	878.5	298.8	440.8	364.1	397.5	475.9	N/A	
86	883.7	301.8	445.6	368.1	399.6	479.8	N/A	
87	887.9	305.2	450.5	371.5	401.2	483.3	N/A	
88	891.3	308.4	455.3	375.1	403.1	486.6	N/A	
89	893.2	311.6	460.1	378.8	405.1	489.8	N/A	
90	893.9	314.8	464.7	382.3	406.8	492.5	N/A	
91	895.1	318.2	469.3	385.8	408.7	495.4	N/A	
92	896.4	321.3	473.9	389.2	410.6	498.3	N/A	
93	895.1	324.7	478.6	392.4	412.1	500.6	N/A	
94	891.9	327.9	483.6	395.6	414.2	502.6	N/A	
95	885.4	331.5	488.5	398.6	416.2	504.0	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
96	877.9	334.6	493.6	401.6	417.8	505.1	N/A
97	869.4	337.9	499.1	404.5	419.6	506.1	N/A
98	857.7	341.9	504.4	407.8	422.1	506.8	N/A
99	846.3	344.9	510.2	410.4	424.8	507.3	N/A
100	840.0	348.7	516.0	412.9	426.1	508.7	N/A
101	832.2	352.1	521.7	415.1	427.4	509.7	N/A
102	823.6	355.9	527.3	417.2	428.3	510.4	N/A
103	813.9	359.6	533.0	419.2	429.4	511.0	N/A
104	801.6	362.4	537.8	421.3	429.9	510.6	N/A
105	787.9	366.1	542.0	423.0	430.1	509.8	N/A
106	774.1	369.5	545.6	424.3	429.9	508.7	N/A
107	760.3	373.0	548.5	425.6	430.7	507.6	N/A
Average	672.4	210.4	325.0	266.6	285.4	352	N/A

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H00134	188.5	190.1	1.6
	<b>B</b>	H00135	189.3	190.7	1.4
	<b>C - 1st Hour</b>	H00136	188.7	189.3	0.6
	<b>Amb</b>	H00152	90.2	90.2	0.0
<b>Probes</b>	<b>A</b>	4A	116022.4	116022.5	0.1
	<b>B</b>	4B	116181.8	116181.9	0.1
	<b>C - 1st Hour</b>	4C	116997.1	116997.3	0.2
<b>O-rings</b>	<b>A</b>	4A	3374.9	3375.4	0.5
	<b>B</b>	4B	3579.3	3579.7	0.4
	<b>C - 1st Hour</b>	4C	3371.4	3372.2	0.8

**Placed in Desiccator on:** 6/12 - 10:30

**Balance Audit (mg):** 100.0 100.0 100.0 100.0

*Undessicated      Dessicated      Dessicated      Desiccated*

<b>Filters</b>	<b>A</b>	190.0	6/6 20:54	190.1	6/14 10:41	190.1	6/15 12:28		
	<b>B</b>	191.0	6/6 20:54	190.8	6/14 10:41	190.7	6/15 12:29		
	<b>C - 1st Hour</b>	189.3	6/6 11:48	189.3	6/14 10:42	189.3	6/15 12:29		
	<b>Amb</b>	90.2	6/6 12:22	90.3	6/15 13:20	90.2	6/15 12:29		
<b>Probes</b>	<b>A</b>			116022.6	6/14 10:52	116022.5	6/15 12:40		
	<b>B</b>			116181.9	6/14 10:52	116181.9	6/15 12:41		
	<b>C - 1st Hour</b>			116997.2	6/14 10:53	116997.3	6/15 12:41		
<b>O-Rings</b>	<b>A</b>			3375.5	6/14 10:32	3375.2	6/15 12:19	3375.4	6/16 8:56
	<b>B</b>			3579.8	6/14 10:32	3579.5	6/15 12:19	3579.7	6/16 8:56
	<b>C - 1st Hour</b>			3372.2	6/14 10:32	3372.2	6/15 12:19		

<b>Train A Aggregate, mg:</b>	<b>2.2</b>
<b>Train B Aggregate, mg:</b>	<b>1.9</b>
<b>Train C Aggregate, mg:</b>	<b>1.6</b>
<b>Ambient Aggregate, mg:</b>	<b>0.0</b>

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 2 Data Summary**

Client: SBI  
Model: 1.7R  
Job #: 23-161  
Tracking #: 135  
Test Date: 6/6/2023

  
\_\_\_\_\_  
Technician Signature

7/3/2023  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI

Model: 1.7R

Run #: 2

Job #: 23-161

Tracking #: 135

Technician: SJB

Date: 6/6/2023

<b>Burn Rate (kg/hr):</b>	<b>0.77</b>
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	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	92.391	95.808	93.844	7.592
Average Gas Velocity in Dilution Tunnel (ft/sec)	18.67			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	21696.9			
Average Gas Meter Temperature (°F)	83.1	78.4	77.1	78.2
Total Sample Volume (dscf)	89.177	94.618	92.527	7.323
Average Tunnel Temperature (°F)	89.9			
Total Time of Test (min)	508			
Total Particulate Catch (mg)	0.1	8.3	8.3	3.5
Particulate Concentration, dry-standard (g/dscf)	0.0000011	0.0000877	0.0000897	0.0004780
Total PM Emissions (g)	0.21	15.91	16.27	10.35
Particulate Emission Rate (g/hr)	0.02	1.88	1.92	10.35
Emissions Factor (g/kg)	-	2.43	2.49	-
Difference from Average Total Particulate Emissions (g)	-	0.18	0.18	-
Difference from Average Total Particulate Emissions (%)	-	1.1%	1.1%	-
Difference from Average Emissions Factor (g/kg)	-	0.03	0.03	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	16.09
Particulate Emission Rate (g/hr)	1.90
Emissions Factor (g/kg)	2.46
HHV Efficiency (%)	71.4%
LHV Efficiency (%)	76.5%
CO Emissions (g/min)	0.98

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 81.6/Max: 89.8	OK
Face Velocity	< 30 ft/min	10.3	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:77.2/Max:90	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 06/06/23  
**Run:** 2  
**Control #:** 23-161  
**Test Duration:** 508  
**Output Category:** Low

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	71.4%	76.5%
<b>Combustion Efficiency</b>	94.7%	94.7%
<b>Heat Transfer Efficiency</b>	75.4%	80.8%

<b>Output Rate (kJ/h)</b>	10,369	9,836	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	0.77	1.70	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	14,521	13,775	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.54	14.41	<b>dry lb</b>
<b>MC wet (%)</b>	17.71		
<b>MC dry (%)</b>	21.52		
<b>Particulate (g )</b>	16.09		
<b>CO (g)</b>	496		
<b>Test Duration (h)</b>	8.47		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.18	5.65
<b>g/kg Dry Fuel</b>	2.46	75.88
<b>g/h</b>	1.90	58.61
<b>g/min</b>	0.03	0.98
<b>lb/MM Btu Output</b>	0.43	13.14

<b>Air/Fuel Ratio (A/F)</b>	20.31
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VERSION:

2.4

4/15/2010

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking # 135  
 Technician: SJB  
 Date: 6/6/2023

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.95  
 Max Allowable Start-up Fuel Weight (lbs): 4.42

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	3.35	In Range	21.7	22.3	15.8	19.9	In Range	2.79	1.27
2	15.75	2.23	In Range	19.7	25.9	24.2	23.3	In Range	1.81	0.82
3	16.00	3.32	In Range	25.9	16.7	23.5	22.0	In Range	2.72	1.24
Core Load Wt. (lbs)		8.90	In Range							

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	2.19	In Range	23.5	14.8	19.1	19.1	In Range	1.84	0.83
2	16.00	3.65	In Range	23.7	23.1	18.2	21.7	In Range	3.00	1.36
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		5.84	In Range							

Total Load Weight (lbs): 14.74 In Range  
 Core Load % of Total Weight: 60% In Range 45-65%  
 Remainder % of Total Weight: 40% In Range 35-55%  
 Total Load % of Target Weight: 102% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.2  
 Total Load Average Moisture Content (%DB): 21.2 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.5  
 Total Test Load Weight (dry basis): 12.16 lbs 5.52 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.90	In Range	10	10	10	10.0	In Range	2.64	1.20

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.35	In Range	18.6	24.9	26.3	23.3	In Range	3.53	1.60

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 1.98 In Range



## LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking # 135  
 Technician: SJB  
 Date: 6/6/2023

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 12  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 17.28  
 Total Load Weight Range (lbs): 16.42 to 18.14  
 Core Load Weight Range (lbs): 7.78 to 11.23  
 Remainder Load Weight Range (lbs): 6.05 to 9.50  
 Core Load Piece Range (lbs): 2.59 to 4.32  
 Remainder Load Piece Range (lbs): 1.73 to 5.18

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	3.39	In Range	26.1	19.2	23.4	22.9	In Range	2.76	1.25
2	16.00	4.07	In Range	22.5	24.1	18.9	21.8	In Range	3.34	1.51
3	16.00	3.52	In Range	21.7	20.5	18.4	20.2	In Range	2.93	1.33
Core Load Wt. (lbs)		10.99	In Range							

### REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	4.05	In Range	21.3	25.3	16.9	21.2	In Range	3.34	1.52
2	16.00	2.49	In Range	25.3	23.1	16.5	21.6	In Range	2.04	0.93
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.53	In Range							

Remainder Load Small/Large Piece Weight Ratio: 61% In Range ≤ 67%  
 Total Load Weight (lbs): 17.52 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: 101% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 12.2  
 Total Load Average Moisture Content (%DB): 21.5 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.7  
 Total Test Load Weight (dry basis): 14.42 lbs 6.54 kg

### TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 1.8 to 3.5  
 Actual Charcoal Bed Wt. (lb): 3.22 In Range

### TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.00 Valid Test (≥90%)

Total Fuel Burned During Test Run:  
 17.5 lbs, wet basis  
 14.4 lbs, dry basis  
 6.54 kg, dry basis

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2  
 Test Start Time: 12:00  
 Test Type: Low Fire

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Recording Interval (min): 1  
 Total Sampling Time (min): 508

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0.0007  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 6/5/2023  
 Test Fuel Scale Audit (kg): 5.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.45	29.40	29.43
Relative Humidity (%)	35.0	37.2	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Platform Scale Audit (kg)	5.0	5.0	

Ambient Sample Volume: 92.391 ft<sup>3</sup>

### Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.000	0.000	cfm @	-5 in. Hg
(B)	0.000	0.000	cfm @	-5 in. Hg
(C)	0.001	0.000	cfm @	-5 in. Hg
(Ambient)	0.001	0.001	cfm @	-5 in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.069	75
2	0.083	75
3	0.080	75
4	0.072	75
5	0.058	75
6	0.078	75
7	0.082	75
8	0.071	75
Center	0.086	75

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 18.28 ft/sec

V<sub>scant</sub>: 19.72 ft/sec

F<sub>p</sub>: 0.927 [ratio]

Initial Tunnel Flow: 364.2 scf/min

Static Pressure: -0.177 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

## WOODSTOVE PREBURN DATA

Client: SBI \_\_\_\_\_  
Model: 1.7R \_\_\_\_\_  
Run #: 2 \_\_\_\_\_

Job #: 23-161 \_\_\_\_\_  
Tracking #: 135 \_\_\_\_\_  
Technician: SJB \_\_\_\_\_  
Date: 6/6/2023 \_\_\_\_\_

**Low Fire Performed as a continuation of High Fire Test, see Run 1 test data for details**

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	333.762		0.076	1.13	77.5	0.00		20.74		138.4	517.0	81.6	80.8
1			0.077	1.20	78.2	0.69	-	20.62	-0.12	145.9	469.1	88.1	80.1
2			0.076	1.17	78.2	0.73	-	20.32	-0.30	156.7	506.1	89.2	82.4
3			0.071	1.24	78.3	0.73	-	19.96	-0.36	180.6	638.3	89.8	84.9
4			0.079	1.10	78.3	0.74	-	19.61	-0.35	142.0	639.0	89.2	85.8
5			0.080	1.01	78.4	0.73	-	19.37	-0.24	130.2	628.0	87.6	84.6
6			0.081	1.04	78.4	0.75	-	19.14	-0.24	125.3	617.4	87.3	85.1
7			0.082	1.03	78.4	0.75	-	18.92	-0.21	121.1	603.8	87.4	85.7
8			0.081	1.05	78.4	0.74	-	18.74	-0.19	120.5	590.6	87.4	85.7
9			0.082	1.24	78.5	0.73	-	18.56	-0.17	119.8	582.5	87.5	84.1
10	335.588	0.183	0.082	1.12	78.5	0.75	105	18.37	-0.19	118.5	575.8	87.7	84.7
11			0.081	1.24	78.5	0.74	-	18.19	-0.18	116.9	565.0	87.6	85.3
12			0.083	1.21	78.5	0.75	-	18.09	-0.10	115.1	546.1	87.5	86.5
13			0.083	1.03	78.5	0.74	-	17.93	-0.16	113.1	523.2	87.3	86.8
14			0.082	1.15	78.5	0.74	-	17.80	-0.13	112.2	504.5	87.2	86.9
15			0.083	1.01	78.4	0.74	-	17.69	-0.11	111.4	485.6	87.1	86.0
16			0.083	1.04	78.4	0.73	-	17.61	-0.08	110.2	466.8	86.9	85.5
17			0.084	1.02	78.5	0.75	-	17.52	-0.08	109.4	451.9	86.8	85.3
18			0.083	0.99	78.5	0.73	-	17.44	-0.08	108.5	440.1	86.7	85.5
19			0.083	0.95	78.5	0.75	-	17.37	-0.08	107.5	430.4	86.6	86.7
20	337.394	0.181	0.083	0.87	78.5	0.74	100	17.27	-0.09	107.2	422.6	86.5	87.1
21			0.084	0.90	78.5	0.75	-	17.17	-0.11	107.0	417.0	86.4	87.3
22			0.084	0.84	78.5	0.73	-	17.06	-0.11	106.7	412.2	86.4	87.1
23			0.085	0.87	78.5	0.73	-	16.96	-0.10	106.4	408.4	86.3	86.8
24			0.085	0.90	78.5	0.74	-	16.86	-0.10	106.1	403.7	86.1	86.6
25			0.084	0.85	78.5	0.75	-	16.76	-0.11	106.0	399.7	86.1	87.2
26			0.083	0.75	78.5	0.75	-	16.65	-0.11	106.1	398.7	86.0	87.8
27			0.084	0.75	78.6	0.76	-	16.53	-0.12	105.8	398.3	85.9	87.5
28			0.085	0.82	78.6	0.78	-	16.41	-0.11	105.8	399.0	85.9	88.2
29			0.084	0.87	78.5	0.77	-	16.29	-0.12	106.0	404.8	85.8	87.5
30	339.195	0.180	0.084	0.78	78.6	0.78	99	16.21	-0.09	105.0	409.2	85.7	86.4
31			0.085	0.77	78.5	0.76	-	16.11	-0.09	104.0	413.5	85.7	85.9
32			0.085	0.80	78.5	0.78	-	16.01	-0.10	103.3	415.1	85.6	86.1

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.085	0.77	78.5	0.78	-	15.91	-0.10	102.9	417.7	85.5	85.5
34			0.086	0.79	78.5	0.79	-	15.80	-0.11	102.7	420.1	85.5	86.2
35			0.085	0.68	78.5	0.79	-	15.69	-0.11	102.5	422.1	85.4	85.0
36			0.085	0.71	78.5	0.79	-	15.59	-0.10	102.3	422.8	85.2	84.9
37			0.085	0.63	78.5	0.78	-	15.48	-0.11	102.1	423.3	85.1	85.2
38			0.084	0.63	78.5	0.77	-	15.35	-0.12	102.1	423.5	85.2	84.8
39			0.086	0.67	78.6	0.78	-	15.24	-0.11	101.8	424.2	85.0	85.0
40	341.018	0.182	0.085	0.55	78.6	0.78	99	15.12	-0.13	101.5	424.7	85.0	85.3
41			0.085	0.75	78.5	0.78	-	15.00	-0.11	101.0	422.3	84.9	85.0
42			0.084	0.60	78.5	0.78	-	14.90	-0.11	100.9	419.3	84.9	86.0
43			0.085	0.86	78.5	0.78	-	14.78	-0.11	100.6	419.2	84.7	84.7
44			0.084	0.63	78.5	0.77	-	14.69	-0.10	100.5	419.9	84.7	85.1
45			0.086	0.69	78.5	0.78	-	14.57	-0.12	100.6	420.2	84.6	85.6
46			0.086	0.87	78.5	0.78	-	14.46	-0.11	100.4	418.7	84.6	85.5
47			0.086	0.56	78.5	0.77	-	14.35	-0.11	100.4	419.7	84.5	85.7
48			0.085	0.52	78.5	0.78	-	14.24	-0.11	100.4	421.1	84.5	85.6
49			0.085	0.55	78.5	0.77	-	14.13	-0.11	100.4	423.6	84.5	85.5
50	342.856	0.184	0.084	0.58	78.5	0.77	100	14.02	-0.11	100.3	422.8	84.4	85.4
51			0.085	0.64	78.4	0.77	-	13.91	-0.11	100.4	423.8	84.5	85.0
52			0.085	0.79	78.4	0.77	-	13.78	-0.13	100.3	425.8	84.4	85.3
53			0.085	0.60	78.4	0.76	-	13.68	-0.10	100.5	426.7	84.4	83.8
54			0.085	0.64	78.4	0.77	-	13.56	-0.12	100.2	427.4	84.3	83.9
55			0.085	0.50	78.4	0.77	-	13.44	-0.12	100.0	428.0	84.1	83.4
56			0.085	0.51	78.4	0.78	-	13.31	-0.13	99.8	428.2	84.1	82.6
57			0.085	0.55	78.4	0.77	-	13.18	-0.12	99.7	427.3	84.1	82.2
58			0.085	0.56	78.4	0.80	-	13.06	-0.13	99.4	426.1	84.1	81.6
59			0.084	0.52	78.5	0.79	-	12.96	-0.10	99.3	424.6	84.1	81.0
60	344.695	0.184	0.085	0.54	78.5	0.79	100	12.84	-0.11	99.4	424.5	84.1	81.2
61			0.084	0.55	78.5	0.78	-	12.73	-0.11	99.1	421.8	84.0	81.0
62			0.085	0.55	78.4	0.77	-	12.63	-0.11	99.0	420.7	84.1	81.1
63			0.086	0.53	78.5	0.77	-	12.52	-0.11	99.0	419.8	84.1	81.3
64			0.086	0.63	78.5	0.78	-	12.41	-0.11	98.8	420.1	84.1	80.4
65			0.085	0.70	78.5	0.76	-	12.30	-0.11	98.8	419.3	84.2	80.1

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.086	0.72	78.6	0.78	-	12.19	-0.11	98.8	418.5	84.4	80.2
67			0.086	0.65	78.7	0.79	-	12.07	-0.12	98.7	419.8	84.7	80.0
68			0.087	0.52	78.7	0.78	-	11.97	-0.10	98.8	419.0	85.0	80.0
69			0.086	0.55	78.7	0.78	-	11.86	-0.11	98.7	420.6	85.2	80.0
70	346.536	0.184	0.085	0.39	78.7	0.78	99	11.76	-0.10	98.5	420.2	85.4	79.9
71			0.086	0.78	78.7	0.80	-	11.66	-0.10	98.6	422.1	85.6	80.5
72			0.086	0.45	78.7	0.80	-	11.55	-0.11	98.6	423.2	85.8	79.7
73			0.086	0.51	78.7	0.81	-	11.45	-0.10	98.5	423.8	85.8	79.7
74			0.086	0.49	78.7	0.82	-	11.33	-0.12	98.7	425.3	85.9	79.6
75			0.086	0.42	78.7	0.82	-	11.22	-0.10	98.9	428.1	86.2	80.3
76			0.086	0.41	78.7	0.83	-	11.10	-0.12	98.9	429.8	86.3	80.7
77			0.087	0.44	78.7	0.85	-	11.00	-0.10	98.9	431.0	86.4	80.2
78			0.085	0.45	78.7	0.85	-	10.89	-0.11	99.1	433.2	86.6	80.3
79			0.086	0.45	78.7	0.85	-	10.76	-0.13	98.6	435.8	86.7	80.1
80	348.379	0.184	0.085	0.45	78.7	0.84	99	10.66	-0.10	97.5	437.0	86.8	80.8
81			0.085	0.44	78.7	0.88	-	10.55	-0.11	97.1	438.1	86.7	81.0
82			0.086	0.46	78.8	0.90	-	10.45	-0.11	96.7	437.5	86.8	81.2
83			0.086	0.46	78.7	0.90	-	10.35	-0.10	96.1	437.2	86.8	81.4
84			0.085	0.47	78.7	0.90	-	10.23	-0.12	95.7	436.6	86.8	81.4
85			0.086	0.47	78.8	0.89	-	10.13	-0.10	95.5	436.8	86.7	80.7
86			0.087	0.47	78.7	0.89	-	10.03	-0.10	94.7	435.0	86.7	79.9
87			0.087	0.45	78.8	0.90	-	9.94	-0.08	94.2	433.5	86.6	79.4
88			0.086	0.48	78.8	0.92	-	9.86	-0.08	93.7	428.9	86.6	79.3
89			0.085	0.49	78.8	0.93	-	9.78	-0.08	93.0	422.8	86.5	79.0
90	350.241	0.186	0.085	0.46	78.7	0.94	100	9.69	-0.09	92.4	415.4	86.3	78.3
91			0.087	0.48	78.7	0.94	-	9.63	-0.07	91.8	409.8	86.4	77.8
92			0.086	0.49	78.8	0.94	-	9.56	-0.06	91.2	403.7	86.2	77.2
93			0.086	0.48	78.8	0.94	-	9.50	-0.06	90.8	398.5	86.2	77.7
94			0.086	0.48	78.7	0.95	-	9.45	-0.06	91.9	393.3	86.2	79.6
95			0.086	0.51	78.7	0.96	-	9.38	-0.07	93.1	389.3	86.2	80.7
96			0.085	0.51	78.8	0.94	-	9.32	-0.06	93.9	385.2	86.4	81.4
97			0.086	0.52	78.8	0.95	-	9.27	-0.05	94.3	382.2	86.6	81.9
98			0.086	0.52	78.8	0.95	-	9.21	-0.06	94.4	382.3	86.5	82.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.086	0.51	78.8	0.94	-	9.15	-0.07	95.4	382.7	86.6	82.9
100	352.121	0.188	0.087	0.52	78.8	0.95	101	9.08	-0.07	96.6	383.5	86.8	83.8
101			0.086	0.51	78.8	0.95	-	9.00	-0.08	97.4	385.7	86.9	84.5
102			0.085	0.53	78.8	0.95	-	8.94	-0.06	97.9	388.6	87.0	84.9
103			0.085	0.51	78.8	0.95	-	8.85	-0.08	98.3	389.0	87.1	85.2
104			0.086	0.52	78.8	0.99	-	8.78	-0.08	98.9	391.7	87.2	85.5
105			0.085	0.51	78.8	1.02	-	8.71	-0.07	99.0	390.4	87.1	85.6
106			0.085	0.49	78.8	1.03	-	8.63	-0.08	99.1	388.2	87.0	85.4
107			0.085	0.52	78.8	1.05	-	8.59	-0.04	98.4	384.8	87.0	84.8
108			0.085	0.53	78.7	1.04	-	8.56	-0.03	98.0	379.3	86.8	84.8
109			0.085	0.51	78.7	1.04	-	8.53	-0.04	97.5	374.8	86.8	84.4
110	353.984	0.186	0.086	0.52	78.7	1.02	100	8.47	-0.06	97.1	370.6	86.8	84.1
111			0.085	0.51	78.7	1.04	-	8.44	-0.03	96.9	366.0	86.7	84.1
112			0.086	0.54	78.7	1.04	-	8.40	-0.04	96.7	361.5	86.5	84.0
113			0.086	0.51	78.7	1.03	-	8.35	-0.05	96.8	356.7	86.4	84.1
114			0.086	0.52	78.7	1.03	-	8.31	-0.03	96.5	352.4	86.5	83.9
115			0.085	0.54	78.7	1.04	-	8.27	-0.04	96.5	349.5	86.5	84.1
116			0.085	0.52	78.7	1.03	-	8.22	-0.05	96.5	346.5	86.4	84.1
117			0.086	0.53	78.7	1.05	-	8.19	-0.04	96.2	343.3	86.4	84.1
118			0.087	0.53	78.6	1.05	-	8.15	-0.04	95.9	339.7	86.3	84.3
119			0.086	0.53	78.6	1.04	-	8.09	-0.06	95.8	336.7	86.2	84.3
120	355.858	0.187	0.086	0.52	78.7	1.05	101	8.05	-0.03	96.0	334.3	86.2	84.1
121			0.086	0.54	78.6	1.05	-	8.01	-0.04	95.9	333.2	86.2	84.2
122			0.087	0.53	78.6	1.05	-	7.98	-0.04	95.9	331.1	86.2	84.3
123			0.087	0.55	78.6	1.05	-	7.93	-0.04	95.6	330.1	86.2	85.4
124			0.087	0.52	78.6	1.05	-	7.89	-0.04	95.4	326.1	86.1	84.3
125			0.085	0.54	78.7	1.05	-	7.87	-0.02	95.2	319.8	86.0	84.3
126			0.087	0.53	78.7	1.08	-	7.85	-0.02	93.7	310.6	85.9	84.7
127			0.087	0.54	78.6	1.08	-	7.79	-0.06	92.5	302.3	85.6	86.9
128			0.087	0.53	78.6	1.08	-	7.73	-0.06	92.2	295.4	85.6	88.6
129			0.086	0.55	78.6	1.14	-	7.67	-0.06	91.8	289.1	85.4	89.5
130	357.706	0.185	0.087	0.53	78.7	1.16	99	7.63	-0.04	91.6	284.0	85.3	89.3
131			0.087	0.54	78.6	1.21	-	7.58	-0.05	91.6	280.7	85.2	89.8

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132			0.087	0.55	78.6	1.22	-	7.51	-0.07	93.1	278.8	85.3	89.4
133			0.087	0.53	78.6	1.23	-	7.50	-0.01	94.1	276.6	85.4	87.5
134			0.087	0.54	78.6	1.27	-	7.52	0.01	94.2	274.4	85.4	85.4
135			0.088	0.54	78.7	1.30	-	7.49	-0.03	93.9	272.5	85.3	86.0
136			0.087	0.53	78.7	1.30	-	7.46	-0.03	93.6	271.4	85.2	84.7
137			0.087	0.52	78.7	1.35	-	7.44	-0.02	93.2	270.1	85.1	84.8
138			0.087	0.51	78.7	1.37	-	7.42	-0.02	93.1	267.7	85.0	85.0
139			0.087	0.51	78.7	1.41	-	7.38	-0.04	93.5	265.1	85.0	84.8
140	359.569	0.186	0.086	0.53	78.7	1.45	99	7.34	-0.04	93.9	263.6	85.1	85.4
141			0.086	0.50	78.6	1.46	-	7.32	-0.02	94.0	261.8	85.1	85.4
142			0.087	0.50	78.6	1.51	-	7.27	-0.05	93.9	259.9	85.0	85.9
143			0.088	0.50	78.6	1.53	-	7.23	-0.04	92.1	258.3	84.9	87.2
144			0.087	0.50	78.6	1.56	-	7.17	-0.06	90.9	255.5	84.7	88.4
145			0.087	0.49	78.6	1.62	-	7.12	-0.06	90.4	254.2	84.6	89.4
146			0.087	0.51	78.7	1.65	-	7.07	-0.04	90.4	252.4	84.6	89.0
147			0.086	0.50	78.7	1.66	-	7.03	-0.05	92.5	251.8	84.6	88.3
148			0.086	0.51	78.7	1.71	-	6.99	-0.03	93.6	251.4	84.8	86.9
149			0.088	0.50	78.7	1.73	-	6.96	-0.03	93.9	250.8	84.8	86.3
150	361.435	0.187	0.087	0.50	78.7	1.74	100	6.94	-0.02	93.4	249.6	84.8	87.5
151			0.088	0.51	78.6	1.77	-	6.90	-0.04	91.2	247.9	84.6	88.7
152			0.088	0.51	78.7	1.87	-	6.86	-0.04	90.6	246.6	84.5	89.8
153			0.086	0.52	78.7	1.88	-	6.81	-0.04	91.9	246.4	84.5	89.4
154			0.087	0.54	78.6	1.90	-	6.77	-0.04	93.1	246.6	84.6	89.0
155			0.087	0.53	78.6	1.92	-	6.74	-0.04	93.5	246.3	84.7	88.3
156			0.088	0.55	78.6	1.93	-	6.72	-0.01	91.8	245.2	84.6	87.9
157			0.086	0.56	78.6	1.98	-	6.67	-0.05	92.4	244.9	84.7	89.4
158			0.088	0.56	78.6	2.02	-	6.63	-0.04	92.7	244.4	84.7	90.0
159			0.086	0.56	78.6	2.02	-	6.59	-0.04	93.2	244.5	84.8	89.0
160	363.310	0.188	0.087	0.58	78.7	2.03	100	6.57	-0.02	93.4	244.4	84.7	88.8
161			0.087	0.56	78.7	2.04	-	6.56	-0.01	93.4	244.3	84.7	88.6
162			0.087	0.56	78.6	2.05	-	6.53	-0.03	92.9	243.6	84.7	88.9
163			0.087	0.55	78.7	2.05	-	6.47	-0.06	92.8	242.9	84.7	88.5
164			0.087	0.55	78.6	2.06	-	6.46	-0.01	93.0	242.5	84.7	88.1



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165			0.087	0.57	78.7	2.03	-	6.44	-0.02	93.2	242.5	84.7	87.5
166			0.086	0.56	78.7	2.02	-	6.43	-0.02	93.2	242.2	84.8	88.0
167			0.087	0.54	78.8	2.01	-	6.41	-0.02	93.1	242.3	84.8	87.8
168			0.087	0.55	78.8	2.01	-	6.39	-0.02	93.1	241.5	84.8	87.3
169			0.087	0.54	78.8	2.00	-	6.39	-0.01	93.0	241.1	84.8	87.9
170	365.184	0.187	0.087	0.58	78.8	1.99	100	6.37	-0.01	93.0	240.6	84.9	87.8
171			0.087	0.56	78.8	2.00	-	6.35	-0.02	93.0	240.1	84.9	87.3
172			0.088	0.56	78.8	1.99	-	6.35	0.00	92.3	238.9	84.8	87.7
173			0.088	0.58	78.8	1.99	-	6.31	-0.04	92.1	238.0	84.8	88.2
174			0.086	0.58	78.7	1.97	-	6.30	-0.02	92.1	236.9	84.8	88.8
175			0.087	0.59	78.7	1.97	-	6.28	-0.01	92.0	236.3	84.7	88.9
176			0.087	0.57	78.7	1.98	-	6.26	-0.02	92.0	235.5	84.8	89.0
177			0.086	0.57	78.7	1.96	-	6.24	-0.02	92.0	234.7	84.7	88.8
178			0.086	0.59	78.7	1.96	-	6.22	-0.03	92.0	234.4	84.6	89.2
179			0.086	0.55	78.7	1.96	-	6.19	-0.02	92.1	233.8	84.7	89.0
180	367.085	0.190	0.087	0.56	78.7	1.96	101	6.19	-0.01	91.9	233.5	84.6	89.2
181			0.087	0.56	78.7	1.95	-	6.17	-0.02	92.0	233.4	84.7	89.4
182			0.087	0.58	78.7	1.97	-	6.15	-0.02	92.1	232.8	84.6	89.3
183			0.087	0.56	78.7	1.95	-	6.15	0.00	92.1	232.5	84.6	89.2
184			0.087	0.56	78.7	1.97	-	6.12	-0.02	92.6	231.6	84.7	88.2
185			0.087	0.58	78.7	1.96	-	6.14	0.02	92.2	231.4	84.7	86.6
186			0.088	0.58	78.7	1.96	-	6.17	0.03	91.2	230.6	84.5	86.5
187			0.087	0.58	78.6	1.96	-	6.17	0.00	90.6	229.2	84.5	85.1
188			0.086	0.56	78.7	1.96	-	6.18	0.01	90.4	228.4	84.4	85.4
189			0.087	0.57	78.7	1.95	-	6.18	0.00	90.1	227.4	84.3	84.8
190	368.981	0.190	0.087	0.57	78.7	1.95	101	6.17	-0.01	89.9	226.2	84.2	85.0
191			0.087	0.57	78.7	1.97	-	6.17	0.00	89.6	225.2	84.2	85.1
192			0.087	0.56	78.7	1.98	-	6.15	-0.02	89.6	224.3	84.2	85.0
193			0.088	0.56	78.7	1.98	-	6.16	0.01	89.4	223.9	84.1	85.1
194			0.088	0.56	78.7	1.97	-	6.14	-0.01	89.1	223.0	84.1	84.9
195			0.088	0.55	78.7	1.97	-	6.12	-0.02	89.0	222.3	84.1	84.9
196			0.088	0.55	78.7	1.96	-	6.12	-0.01	88.9	221.7	84.0	84.5
197			0.088	0.56	78.7	1.96	-	6.10	-0.02	88.8	221.0	84.0	84.8

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198			0.088	0.58	78.7	1.97	-	6.08	-0.01	88.7	220.3	84.0	84.5
199			0.087	0.58	78.7	1.97	-	6.07	-0.02	88.6	219.6	84.0	84.7
200	370.888	0.191	0.087	0.59	78.7	1.98	101	6.05	-0.01	88.3	219.0	83.9	84.5
201			0.089	0.58	78.8	1.97	-	6.04	-0.02	88.4	218.2	83.9	84.6
202			0.088	0.58	78.8	1.99	-	6.03	-0.01	88.2	217.4	84.0	84.3
203			0.088	0.58	78.8	1.98	-	6.01	-0.02	88.2	216.9	83.8	84.3
204			0.088	0.59	78.8	1.98	-	6.00	-0.01	88.1	216.3	83.8	84.7
205			0.088	0.59	78.8	1.99	-	5.98	-0.02	88.1	215.7	83.8	84.0
206			0.088	0.58	78.8	1.99	-	5.98	0.00	87.9	215.0	83.7	84.1
207			0.088	0.56	78.8	1.99	-	5.94	-0.04	87.9	214.8	83.7	84.1
208			0.087	0.58	78.8	1.99	-	5.93	-0.01	87.8	214.0	83.6	83.7
209			0.088	0.57	78.7	1.99	-	5.91	-0.02	87.7	213.4	83.6	84.2
210	372.800	0.191	0.088	0.58	78.7	1.99	101	5.90	-0.01	87.7	212.8	83.6	84.1
211			0.087	0.58	78.7	1.99	-	5.89	-0.01	87.6	212.2	83.5	84.1
212			0.088	0.57	78.7	2.00	-	5.88	-0.01	87.5	211.6	83.5	83.9
213			0.088	0.56	78.6	2.01	-	5.86	-0.01	87.5	211.2	83.4	84.1
214			0.089	0.55	78.6	2.00	-	5.84	-0.02	87.5	210.8	83.4	83.6
215			0.087	0.57	78.7	2.00	-	5.83	-0.01	87.3	210.3	83.4	83.8
216			0.088	0.56	78.7	2.00	-	5.81	-0.02	87.3	209.3	83.3	84.1
217			0.088	0.52	78.6	2.01	-	5.80	-0.01	87.3	208.8	83.3	83.6
218			0.088	0.56	78.6	2.01	-	5.79	-0.01	87.2	208.4	83.3	83.6
219			0.087	0.52	78.6	2.01	-	5.78	-0.01	87.2	207.7	83.4	83.5
220	374.710	0.191	0.088	0.56	78.6	2.00	100	5.75	-0.03	87.2	207.5	83.3	83.5
221			0.088	0.57	78.7	2.01	-	5.75	0.00	87.1	207.2	83.3	83.3
222			0.088	0.53	78.6	2.02	-	5.71	-0.03	87.1	206.5	83.2	83.7
223			0.088	0.53	78.6	2.03	-	5.71	-0.01	86.9	206.2	83.1	83.5
224			0.088	0.55	78.6	2.05	-	5.70	-0.01	87.0	205.9	83.2	83.5
225			0.087	0.54	78.6	2.03	-	5.69	-0.01	86.9	205.8	83.2	83.6
226			0.088	0.52	78.6	2.04	-	5.68	-0.01	86.9	205.3	83.2	82.9
227			0.088	0.53	78.6	2.03	-	5.66	-0.02	86.8	204.7	83.1	83.3
228			0.088	0.55	78.6	2.03	-	5.65	-0.01	86.7	204.3	83.1	83.4
229			0.088	0.57	78.6	2.04	-	5.62	-0.03	86.7	204.2	83.0	83.1
230	376.614	0.190	0.088	0.54	78.7	2.04	100	5.61	-0.01	86.7	203.7	83.1	83.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231			0.088	0.52	78.6	2.04	-	5.60	-0.02	86.6	203.2	83.0	83.2
232			0.088	0.53	78.6	2.05	-	5.59	-0.01	86.6	203.1	83.1	83.3
233			0.088	0.54	78.6	2.04	-	5.58	-0.01	86.6	202.4	83.0	83.3
234			0.088	0.56	78.7	2.04	-	5.56	-0.02	86.6	202.1	83.1	82.9
235			0.088	0.54	78.7	2.06	-	5.54	-0.02	86.5	201.6	83.0	82.7
236			0.088	0.49	78.7	2.04	-	5.53	0.00	86.4	201.0	82.9	83.3
237			0.088	0.54	78.7	2.04	-	5.51	-0.02	86.4	200.3	82.8	83.0
238			0.088	0.51	78.7	2.05	-	5.50	-0.01	86.4	200.0	82.8	83.0
239			0.088	0.50	78.7	2.06	-	5.51	0.01	86.3	199.5	82.9	82.8
240	378.507	0.189	0.088	0.52	78.7	2.06	99	5.49	-0.02	86.4	199.1	82.8	83.1
241			0.088	0.52	78.7	2.06	-	5.48	-0.01	86.3	198.5	82.8	82.8
242			0.088	0.51	78.6	2.05	-	5.48	0.00	86.4	197.8	82.8	83.0
243			0.088	0.51	78.7	2.06	-	5.46	-0.02	86.3	197.3	82.7	82.7
244			0.088	0.50	78.7	2.07	-	5.45	-0.01	86.2	196.5	82.7	82.9
245			0.088	0.50	78.7	2.06	-	5.45	0.00	86.1	195.8	82.7	83.0
246			0.088	0.49	78.7	2.09	-	5.43	-0.02	86.1	195.4	82.8	83.2
247			0.089	0.50	78.6	2.10	-	5.43	0.00	86.1	195.2	82.8	82.9
248			0.088	0.51	78.6	2.11	-	5.41	-0.01	86.1	195.1	82.7	83.2
249			0.089	0.52	78.6	2.10	-	5.40	-0.02	86.1	194.4	82.7	82.4
250	380.399	0.189	0.088	0.51	78.6	2.10	99	5.38	-0.01	86.0	194.0	82.7	82.9
251			0.087	0.50	78.6	2.10	-	5.39	0.00	86.0	193.3	82.7	82.3
252			0.088	0.51	78.6	2.10	-	5.37	-0.02	85.9	192.8	82.7	82.6
253			0.088	0.52	78.6	2.12	-	5.36	-0.01	85.9	192.1	82.6	82.8
254			0.089	0.51	78.6	2.13	-	5.35	-0.01	85.8	191.6	82.7	83.0
255			0.087	0.50	78.5	2.11	-	5.34	-0.01	85.8	191.0	82.6	82.9
256			0.089	0.51	78.6	2.14	-	5.33	-0.01	85.7	190.6	82.6	82.7
257			0.088	0.51	78.5	2.14	-	5.32	-0.01	85.7	190.0	82.7	82.8
258			0.088	0.50	78.5	2.14	-	5.30	-0.01	85.6	189.4	82.7	83.0
259			0.088	0.52	78.5	2.15	-	5.29	-0.01	85.7	188.7	82.7	82.7
260	382.289	0.189	0.089	0.51	78.5	2.15	99	5.28	-0.01	85.6	188.2	82.6	82.8
261			0.088	0.50	78.5	2.15	-	5.27	-0.01	85.6	187.8	82.6	83.0
262			0.088	0.54	78.5	2.20	-	5.27	0.00	85.5	187.3	82.6	82.6
263			0.088	0.53	78.5	2.21	-	5.25	-0.02	85.6	186.9	82.7	82.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264			0.088	0.52	78.5	2.21	-	5.24	0.00	85.4	186.3	82.7	82.5
265			0.088	0.52	78.5	2.21	-	5.22	-0.02	85.4	186.1	82.6	82.8
266			0.088	0.50	78.5	2.20	-	5.22	0.00	85.4	185.7	82.6	82.3
267			0.087	0.51	78.5	2.21	-	5.21	-0.01	85.3	185.0	82.6	82.4
268			0.089	0.52	78.5	2.23	-	5.20	-0.01	85.3	184.7	82.6	82.7
269			0.088	0.51	78.5	2.22	-	5.19	-0.01	85.3	184.5	82.6	82.3
270	384.198	0.191	0.088	0.51	78.5	2.22	100	5.18	-0.01	85.3	184.2	82.6	82.5
271			0.088	0.51	78.5	2.23	-	5.16	-0.01	85.2	183.5	82.5	82.8
272			0.088	0.50	78.4	2.22	-	5.15	-0.01	85.2	183.1	82.6	82.4
273			0.087	0.50	78.4	2.23	-	5.15	-0.01	85.1	182.8	82.5	82.7
274			0.088	0.48	78.4	2.24	-	5.14	0.00	85.1	182.3	82.4	82.6
275			0.088	0.50	78.4	2.23	-	5.13	-0.01	85.0	182.1	82.4	82.6
276			0.088	0.49	78.4	2.24	-	5.12	-0.01	85.0	181.9	82.4	82.4
277			0.089	0.50	78.4	2.23	-	5.12	-0.01	85.0	181.5	82.5	82.5
278			0.088	0.51	78.3	2.24	-	5.11	-0.01	84.9	181.0	82.4	82.5
279			0.087	0.48	78.3	2.25	-	5.09	-0.02	84.9	180.7	82.4	82.6
280	386.090	0.189	0.088	0.50	78.3	2.25	99	5.08	-0.01	84.9	180.5	82.3	82.6
281			0.088	0.49	78.4	2.30	-	5.07	0.00	84.9	180.0	82.3	82.4
282			0.088	0.50	78.3	2.31	-	5.06	-0.01	84.9	179.8	82.3	82.6
283			0.088	0.49	78.4	2.31	-	5.05	0.00	84.9	179.3	82.4	82.1
284			0.088	0.48	78.4	2.30	-	5.04	-0.02	84.7	179.1	82.3	82.4
285			0.089	0.49	78.4	2.31	-	5.04	0.00	84.8	179.0	82.3	82.3
286			0.088	0.47	78.4	2.32	-	5.02	-0.01	84.7	178.5	82.3	82.3
287			0.088	0.49	78.4	2.32	-	5.02	0.00	84.6	178.3	82.3	82.3
288			0.088	0.52	78.4	2.34	-	5.00	-0.02	84.6	178.0	82.2	82.4
289			0.087	0.49	78.4	2.36	-	4.99	-0.02	84.6	177.5	82.3	82.2
290	387.998	0.191	0.088	0.49	78.3	2.36	100	4.99	0.00	84.6	177.3	82.2	82.0
291			0.088	0.46	78.3	2.36	-	4.98	-0.01	84.5	177.1	82.2	82.3
292			0.088	0.48	78.3	2.32	-	4.97	-0.01	84.5	176.6	82.1	82.4
293			0.087	0.48	78.3	2.34	-	4.95	-0.02	84.5	176.4	82.1	82.3
294			0.087	0.47	78.3	2.35	-	4.95	0.00	84.6	176.1	82.1	82.7
295			0.087	0.48	78.2	2.37	-	4.94	-0.01	84.5	175.7	82.1	82.2
296			0.088	0.46	78.2	2.40	-	4.92	-0.02	84.4	175.6	82.0	82.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297			0.088	0.49	78.3	2.38	-	4.93	0.00	84.4	175.5	82.0	82.1
298			0.088	0.47	78.3	2.39	-	4.90	-0.03	84.4	175.2	82.1	82.2
299			0.087	0.48	78.3	2.38	-	4.90	0.00	84.3	174.8	82.0	82.0
300	389.888	0.189	0.088	0.47	78.2	2.40	99	4.89	-0.01	84.4	174.6	82.0	82.1
301			0.089	0.46	78.2	2.41	-	4.89	0.00	84.4	174.4	81.9	81.6
302			0.088	0.45	78.2	2.48	-	4.88	-0.01	84.3	174.1	82.0	82.2
303			0.089	0.44	78.2	2.49	-	4.87	-0.01	84.3	173.8	82.0	82.3
304			0.088	0.43	78.3	2.49	-	4.86	-0.01	84.2	173.6	81.9	82.2
305			0.088	0.45	78.3	2.50	-	4.84	-0.02	84.3	173.6	82.0	82.3
306			0.088	0.44	78.2	2.50	-	4.83	-0.01	84.2	173.4	82.0	82.2
307			0.088	0.44	78.2	2.51	-	4.82	-0.01	84.2	173.3	82.0	82.2
308			0.089	0.44	78.2	2.52	-	4.81	-0.01	84.2	173.3	82.0	82.1
309			0.088	0.43	78.2	2.52	-	4.80	-0.01	84.1	173.2	81.9	82.3
310	391.806	0.192	0.088	0.42	78.2	2.54	101	4.79	-0.01	84.1	173.0	81.9	81.9
311			0.087	0.42	78.2	2.54	-	4.78	-0.01	84.1	173.0	81.9	81.8
312			0.088	0.43	78.2	2.55	-	4.78	0.00	84.1	172.8	82.0	81.8
313			0.088	0.42	78.2	2.54	-	4.76	-0.02	84.0	172.9	82.2	82.1
314			0.089	0.40	78.1	2.55	-	4.75	0.00	84.0	172.8	82.5	82.2
315			0.088	0.42	78.2	2.56	-	4.75	-0.01	84.0	172.7	82.8	82.3
316			0.088	0.43	78.1	2.57	-	4.74	-0.01	83.9	172.5	82.9	82.1
317			0.089	0.42	78.2	2.56	-	4.73	-0.01	83.9	172.4	83.1	82.1
318			0.087	0.42	78.2	2.59	-	4.72	-0.01	84.0	172.1	83.3	82.1
319			0.089	0.43	78.2	2.58	-	4.70	-0.02	83.9	172.1	83.3	82.2
320	393.713	0.191	0.088	0.41	78.2	2.61	100	4.70	0.00	83.9	172.0	83.5	81.8
321			0.088	0.42	78.2	2.59	-	4.70	0.00	83.9	172.0	83.6	82.0
322			0.089	0.42	78.2	2.64	-	4.68	-0.02	83.8	171.8	83.7	81.9
323			0.088	0.50	78.1	2.65	-	4.67	-0.01	83.9	172.0	83.8	81.9
324			0.089	0.47	78.1	2.66	-	4.66	0.00	83.8	172.1	84.0	82.0
325			0.088	0.52	78.1	2.67	-	4.64	-0.02	83.8	171.9	84.1	81.8
326			0.088	0.46	78.1	2.67	-	4.64	-0.01	83.9	171.7	84.1	81.7
327			0.087	0.44	78.1	2.67	-	4.62	-0.01	83.8	171.6	84.2	82.0
328			0.088	0.56	78.0	2.69	-	4.61	-0.01	83.8	171.6	84.3	82.0
329			0.089	0.57	78.1	2.67	-	4.60	-0.01	83.8	171.4	84.4	81.6

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	395.615	0.190	0.088	0.52	78.0	2.67	100	4.59	-0.01	83.7	171.6	84.5	81.8
331			0.088	0.53	78.0	2.68	-	4.59	0.00	83.8	171.7	84.6	81.8
332			0.087	0.53	78.1	2.76	-	4.57	-0.02	83.8	171.6	84.6	81.7
333			0.088	0.47	78.1	2.75	-	4.57	-0.01	83.7	171.5	84.7	82.0
334			0.088	0.50	78.1	2.76	-	4.56	-0.01	83.7	171.5	84.7	81.6
335			0.088	0.43	78.1	2.76	-	4.55	-0.01	83.7	171.5	84.8	81.7
336			0.087	0.51	78.1	2.77	-	4.54	-0.01	83.7	171.4	84.8	81.6
337			0.089	0.61	78.0	2.78	-	4.53	-0.01	83.6	171.4	84.8	81.8
338			0.088	0.65	78.0	2.78	-	4.52	-0.02	83.6	171.2	84.9	81.9
339			0.088	0.56	78.0	2.81	-	4.51	-0.01	83.6	171.2	84.9	81.7
340	397.519	0.190	0.088	0.57	78.0	2.81	100	4.50	-0.01	83.6	171.2	85.0	81.5
341			0.087	0.51	78.1	2.81	-	4.49	-0.01	83.7	171.2	85.0	81.8
342			0.087	0.65	78.0	2.82	-	4.48	-0.01	83.6	171.0	85.0	81.9
343			0.088	0.53	78.0	2.81	-	4.47	-0.01	83.6	171.1	85.1	81.8
344			0.087	0.57	78.0	2.84	-	4.47	0.00	83.6	171.1	85.1	81.7
345			0.089	0.49	78.0	2.82	-	4.47	0.00	83.6	171.3	85.2	81.9
346			0.089	0.75	78.0	2.83	-	4.45	-0.01	83.6	171.2	85.2	81.9
347			0.089	0.59	78.0	2.84	-	4.43	-0.02	83.6	171.2	85.3	81.9
348			0.089	0.74	78.0	2.85	-	4.42	-0.01	83.6	171.1	85.2	81.7
349			0.089	0.53	78.0	2.85	-	4.42	0.00	83.5	171.2	85.2	81.8
350	399.411	0.189	0.088	0.47	78.1	2.84	99	4.41	-0.01	83.6	171.3	85.3	81.5
351			0.088	0.76	78.0	2.88	-	4.40	-0.02	83.5	171.4	85.2	81.8
352			0.088	0.54	78.1	2.99	-	4.39	-0.01	83.5	171.3	85.3	81.4
353			0.089	0.64	78.1	3.00	-	4.38	-0.01	83.5	171.3	85.3	81.5
354			0.089	0.52	78.1	3.00	-	4.37	0.00	83.5	171.4	85.4	81.6
355			0.088	0.44	78.1	3.01	-	4.36	-0.02	83.6	171.4	85.5	81.8
356			0.089	0.47	78.1	3.03	-	4.34	-0.02	83.5	171.6	85.5	81.7
357			0.088	0.44	78.2	3.03	-	4.33	-0.01	83.5	171.6	85.4	81.8
358			0.088	0.43	78.2	3.06	-	4.32	-0.01	83.4	171.7	85.4	81.7
359			0.089	0.50	78.2	3.06	-	4.31	-0.01	83.4	171.6	85.3	81.7
360	401.332	0.192	0.089	0.47	78.2	3.06	101	4.30	-0.01	83.4	171.6	85.4	81.7
361			0.088	0.47	78.2	3.04	-	4.30	0.00	83.5	171.6	85.5	81.7
362			0.088	0.48	78.2	3.07	-	4.29	-0.01	83.5	171.8	85.5	81.5

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363			0.088	0.45	78.2	3.08	-	4.28	-0.01	83.4	171.8	85.5	81.6
364			0.088	0.45	78.2	3.07	-	4.27	-0.01	83.4	171.9	85.5	81.7
365			0.089	0.44	78.2	3.09	-	4.26	-0.01	83.4	171.8	85.5	81.8
366			0.089	0.42	78.1	3.11	-	4.25	-0.01	83.4	171.5	85.6	81.7
367			0.088	0.45	78.1	3.10	-	4.24	-0.01	83.4	171.5	85.5	81.5
368			0.089	0.45	78.1	3.13	-	4.23	-0.01	83.4	171.4	85.6	81.5
369			0.088	0.42	78.1	3.12	-	4.23	0.00	83.4	171.5	85.5	81.5
370	403.245	0.191	0.088	0.43	78.1	3.17	100	4.21	-0.02	83.4	171.4	85.5	81.7
371			0.089	0.43	78.1	3.14	-	4.21	0.00	83.4	171.2	85.5	81.6
372			0.089	0.43	78.1	3.18	-	4.19	-0.02	83.4	171.0	85.6	81.6
373			0.088	0.47	78.2	3.20	-	4.19	0.00	83.4	170.8	85.5	81.6
374			0.088	0.42	78.2	3.23	-	4.18	-0.01	83.3	170.9	85.5	81.6
375			0.088	0.42	78.3	3.24	-	4.18	0.00	83.3	170.9	85.5	81.4
376			0.088	0.50	78.3	3.24	-	4.16	-0.01	83.3	171.1	85.5	81.4
377			0.088	0.42	78.4	3.25	-	4.15	-0.02	83.3	170.8	85.6	81.3
378			0.088	0.41	78.5	3.23	-	4.14	-0.01	83.3	170.8	85.6	81.3
379			0.088	0.43	78.5	3.27	-	4.13	-0.01	83.3	170.6	85.7	81.6
380	405.165	0.192	0.088	0.42	78.6	3.26	101	4.12	-0.01	83.3	170.6	85.6	81.7
381			0.087	0.45	78.5	3.26	-	4.12	0.00	83.3	170.3	85.6	81.5
382			0.089	0.48	78.5	3.28	-	4.11	-0.01	83.2	170.3	85.5	81.8
383			0.089	0.46	78.5	3.30	-	4.09	-0.02	83.2	170.2	85.7	81.5
384			0.088	0.46	78.5	3.33	-	4.09	0.00	83.2	170.4	85.6	81.8
385			0.089	0.47	78.4	3.31	-	4.09	0.00	83.2	170.1	85.6	81.6
386			0.089	0.44	78.4	3.33	-	4.07	-0.02	83.3	170.1	85.6	81.4
387			0.088	0.45	78.4	3.35	-	4.06	0.00	83.3	170.3	85.7	81.3
388			0.088	0.42	78.4	3.35	-	4.05	-0.02	83.3	170.1	85.7	81.4
389			0.089	0.50	78.4	3.37	-	4.04	0.00	83.3	170.2	85.9	81.4
390	407.074	0.191	0.089	0.51	78.4	3.37	100	4.03	-0.01	83.3	170.1	86.0	81.3
391			0.088	0.52	78.4	3.37	-	4.03	0.00	83.2	170.2	85.9	81.6
392			0.088	0.43	78.4	3.42	-	4.02	-0.02	83.2	170.4	86.1	81.6
393			0.088	0.43	78.4	3.43	-	4.01	-0.01	83.2	170.4	86.2	81.6
394			0.089	0.43	78.4	3.45	-	4.00	-0.01	83.2	170.2	86.2	81.8
395			0.089	0.43	78.4	3.44	-	4.00	0.00	83.2	170.2	86.3	81.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396			0.088	0.43	78.4	3.44	-	3.99	-0.01	83.2	170.1	86.4	81.5
397			0.087	0.42	78.3	3.49	-	3.98	-0.01	83.2	169.9	86.4	81.8
398			0.088	0.42	78.4	3.48	-	3.97	0.00	83.2	169.8	86.5	81.7
399			0.089	0.42	78.3	3.47	-	3.96	-0.02	83.2	169.7	86.6	81.3
400	408.984	0.191	0.087	0.42	78.3	3.49	100	3.95	0.00	83.2	169.7	86.6	81.3
401			0.087	0.43	78.3	3.48	-	3.94	-0.01	83.2	169.6	86.6	81.3
402			0.088	0.42	78.3	3.53	-	3.94	-0.01	83.1	169.4	86.6	81.2
403			0.087	0.42	78.3	3.54	-	3.93	-0.01	83.2	168.8	86.6	81.5
404			0.089	0.43	78.3	3.55	-	3.93	-0.01	83.2	168.8	86.7	81.5
405			0.088	0.44	78.3	3.54	-	3.91	-0.02	83.2	168.8	86.8	81.1
406			0.089	0.46	78.3	3.57	-	3.91	0.00	83.1	168.6	86.7	81.5
407			0.088	0.47	78.3	3.60	-	3.90	-0.01	83.1	168.4	86.8	81.6
408			0.089	0.47	78.3	3.58	-	3.89	-0.02	83.1	168.2	86.9	81.5
409			0.088	0.43	78.2	3.60	-	3.89	0.00	83.1	167.9	86.8	81.5
410	410.894	0.191	0.088	0.44	78.3	3.58	100	3.87	-0.02	83.0	167.7	86.8	81.5
411			0.089	0.43	78.3	3.60	-	3.86	-0.01	83.1	167.6	86.9	81.2
412			0.089	0.43	78.2	3.62	-	3.86	0.00	83.1	167.7	86.9	81.5
413			0.089	0.43	78.3	3.64	-	3.85	-0.01	83.0	167.6	86.9	81.6
414			0.088	0.48	78.2	3.65	-	3.84	-0.01	83.1	167.5	87.0	81.5
415			0.088	0.41	78.2	3.66	-	3.83	-0.01	83.0	167.3	86.8	81.6
416			0.088	0.53	78.3	3.69	-	3.83	0.00	83.1	167.2	86.7	81.7
417			0.088	0.53	78.2	3.66	-	3.81	-0.02	83.1	166.9	86.6	81.6
418			0.089	0.51	78.2	3.68	-	3.81	0.00	83.0	166.9	86.4	81.5
419			0.088	0.49	78.2	3.67	-	3.81	-0.01	83.0	167.0	86.3	81.4
420	412.803	0.191	0.088	0.47	78.3	3.73	100	3.79	-0.02	83.0	167.0	86.1	81.5
421			0.088	0.44	78.3	3.73	-	3.79	0.00	83.0	166.9	86.0	81.5
422			0.089	0.43	78.3	3.72	-	3.77	-0.02	83.0	166.5	85.9	81.6
423			0.089	0.51	78.2	3.73	-	3.77	0.00	83.0	166.6	85.8	81.5
424			0.088	0.60	78.2	3.73	-	3.77	0.00	82.9	166.6	85.6	81.6
425			0.088	0.54	78.2	3.74	-	3.76	-0.01	83.0	166.4	85.6	81.3
426			0.088	0.49	78.2	3.75	-	3.75	-0.01	83.0	166.1	85.5	81.3
427			0.089	0.50	78.2	3.76	-	3.75	0.00	83.0	166.1	85.5	81.2
428			0.088	0.46	78.2	3.75	-	3.74	-0.01	82.8	165.9	85.3	81.6



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
429			0.088	0.49	78.2	3.76	-	3.73	-0.01	82.8	165.9	85.3	81.3
430	414.705	0.190	0.088	0.54	78.2	3.76	100	3.72	-0.01	82.9	166.1	85.2	81.4
431			0.088	0.52	78.2	3.78	-	3.71	-0.01	82.9	165.8	85.1	81.5
432			0.088	0.53	78.2	3.83	-	3.71	0.00	82.9	165.7	85.1	81.5
433			0.088	0.49	78.2	3.84	-	3.70	-0.01	82.8	165.5	85.0	81.1
434			0.088	0.53	78.2	3.86	-	3.69	-0.01	82.8	165.5	84.9	81.5
435			0.089	0.47	78.2	3.87	-	3.68	-0.01	82.8	165.4	84.9	81.5
436			0.088	0.49	78.2	3.88	-	3.67	-0.01	82.8	165.3	84.9	81.3
437			0.089	0.60	78.2	3.89	-	3.66	-0.01	82.8	165.2	84.8	81.4
438			0.088	0.58	78.2	3.90	-	3.65	-0.01	82.8	164.9	84.8	81.2
439			0.088	0.47	78.2	3.89	-	3.65	0.00	82.9	164.7	84.8	81.2
440	416.612	0.191	0.088	0.48	78.2	3.89	100	3.64	-0.01	82.8	164.6	84.8	81.2
441			0.088	0.60	78.2	3.90	-	3.63	-0.01	82.8	164.6	84.7	81.4
442			0.089	0.43	78.2	3.99	-	3.62	-0.01	82.8	164.5	84.6	81.5
443			0.088	0.61	78.2	4.02	-	3.61	-0.02	82.7	164.2	84.6	81.2
444			0.089	0.55	78.2	4.00	-	3.61	0.00	82.8	164.1	84.6	81.3
445			0.088	0.42	78.2	3.98	-	3.60	-0.01	82.8	163.9	84.5	81.3
446			0.088	0.72	78.2	3.99	-	3.59	-0.01	82.7	163.6	84.4	81.2
447			0.088	0.51	78.2	3.98	-	3.59	0.00	82.7	163.5	84.5	81.1
448			0.088	0.47	78.2	3.99	-	3.57	-0.02	82.7	163.4	84.4	81.4
449			0.088	0.57	78.2	4.00	-	3.57	0.00	82.7	163.4	84.4	81.3
450	418.516	0.190	0.088	0.61	78.2	4.02	100	3.56	-0.01	82.6	163.1	84.4	81.4
451			0.088	0.50	78.2	4.02	-	3.55	-0.01	82.7	163.0	84.4	81.5
452			0.088	0.53	78.2	4.09	-	3.55	0.00	82.7	162.8	84.4	81.2
453			0.088	0.63	78.2	4.08	-	3.55	0.00	82.7	162.6	84.4	81.2
454			0.089	0.52	78.2	4.09	-	3.54	-0.01	82.7	162.3	84.3	81.2
455			0.088	0.52	78.2	4.09	-	3.53	0.00	82.6	162.2	84.3	81.1
456			0.089	0.55	78.2	4.11	-	3.53	-0.01	82.5	162.0	84.2	81.3
457			0.089	0.48	78.2	4.10	-	3.52	-0.01	82.6	161.9	84.2	81.3
458			0.088	0.49	78.2	4.11	-	3.51	0.00	82.6	161.8	84.2	81.2
459			0.088	0.53	78.2	4.11	-	3.51	-0.01	82.6	161.6	84.2	81.2
460	420.425	0.191	0.089	0.52	78.2	4.14	100	3.49	-0.02	82.5	161.5	84.2	81.1
461			0.088	0.52	78.2	4.15	-	3.49	0.00	82.5	161.3	84.2	81.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
462			0.088	0.58	78.2	4.16	-	3.48	-0.01	82.5	161.3	84.2	81.2
463			0.089	0.64	78.2	4.16	-	3.47	-0.01	82.6	161.1	84.3	81.4
464			0.088	0.60	78.2	4.15	-	3.46	-0.01	82.5	161.0	84.2	81.1
465			0.088	0.60	78.2	4.17	-	3.46	0.00	82.5	160.9	84.1	81.3
466			0.088	0.61	78.2	4.16	-	3.45	-0.02	82.5	160.6	84.1	81.1
467			0.088	0.59	78.2	4.40	-	3.45	0.00	82.5	160.6	84.2	81.4
468			0.088	0.61	78.2	4.27	-	3.45	0.00	82.5	160.6	84.1	81.3
469			0.088	0.62	78.1	4.27	-	3.44	-0.01	82.4	160.1	84.1	81.2
470	422.326	0.190	0.089	0.66	78.2	4.28	99	3.43	-0.01	82.5	160.1	84.1	81.3
471			0.088	0.40	78.2	4.29	-	3.43	0.00	82.4	160.1	84.1	81.2
472			0.088	0.74	78.1	4.28	-	3.42	-0.01	82.5	159.7	84.1	81.1
473			0.089	0.74	78.1	4.30	-	3.43	0.00	82.4	159.5	84.1	81.0
474			0.089	0.65	78.2	4.30	-	3.41	-0.01	82.4	159.2	84.1	81.2
475			0.088	0.66	78.2	4.31	-	3.39	-0.02	82.4	158.9	84.2	81.2
476			0.088	0.76	78.2	4.30	-	3.39	0.00	82.4	159.2	84.1	81.2
477			0.088	0.65	78.2	4.32	-	3.38	-0.01	82.3	159.1	84.0	81.3
478			0.088	0.68	78.2	4.32	-	3.37	0.00	82.4	159.1	84.1	81.4
479			0.088	0.64	78.2	4.33	-	3.37	0.00	82.4	159.1	84.0	81.3
480	424.235	0.191	0.088	0.62	78.2	4.33	100	3.36	-0.01	82.3	158.9	84.0	81.2
481			0.089	0.65	78.2	4.31	-	3.37	0.00	82.3	158.8	84.0	81.2
482			0.088	0.73	78.2	4.39	-	3.35	-0.01	82.3	158.5	83.9	81.2
483			0.089	0.71	78.2	4.39	-	3.35	-0.01	82.4	158.2	84.0	81.3
484			0.089	0.80	78.2	4.37	-	3.35	0.00	82.3	158.1	83.9	81.2
485			0.088	0.66	78.2	4.41	-	3.34	-0.01	82.3	158.2	83.9	81.2
486			0.089	0.71	78.2	4.41	-	3.34	0.01	82.3	157.8	84.0	81.1
487			0.087	0.79	78.2	4.39	-	3.32	-0.02	82.3	157.7	84.0	81.0
488			0.088	0.76	78.1	4.40	-	3.32	0.00	82.2	157.2	83.9	81.0
489			0.088	0.80	78.1	4.43	-	3.31	-0.01	82.1	157.4	83.9	80.9
490	426.134	0.190	0.089	0.70	78.1	4.43	99	3.32	0.00	82.2	157.0	84.0	81.2
491			0.088	0.73	78.1	4.43	-	3.31	-0.01	82.2	156.8	83.9	81.1
492			0.088	0.71	78.1	4.52	-	3.30	-0.01	82.1	156.5	83.9	81.0
493			0.088	0.76	78.2	4.53	-	3.30	0.00	82.2	156.3	84.0	81.0
494			0.088	0.77	78.2	4.48	-	3.28	-0.01	82.1	155.9	83.9	81.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
495			0.088	0.70	78.2	4.53	-	3.29	0.00	82.1	155.6	83.9	81.1
496			0.088	0.80	78.2	4.52	-	3.28	0.00	82.1	155.4	83.9	80.9
497			0.088	0.73	78.2	4.54	-	3.27	-0.01	82.1	155.2	83.9	80.8
498			0.088	0.74	78.2	4.56	-	3.26	-0.01	82.1	154.8	83.9	81.1
499			0.088	0.83	78.2	4.54	-	3.26	0.00	81.9	154.6	83.8	81.2
500	428.047	0.191	0.089	0.77	78.2	4.56	100	3.26	0.00	82.0	154.4	83.9	81.0
501			0.088	0.78	78.2	4.55	-	3.25	-0.01	82.1	154.0	83.9	81.1
502			0.089	0.74	78.2	4.56	-	3.25	0.00	82.0	153.8	83.9	81.1
503			0.089	0.68	78.1	4.59	-	3.24	-0.01	82.0	153.5	83.9	81.1
504			0.089	0.76	78.2	4.58	-	3.24	0.01	81.9	153.1	83.8	81.0
505			0.089	0.68	78.2	4.60	-	3.23	-0.01	82.0	152.8	83.8	80.9
506			0.089	0.81	78.2	4.58	-	3.23	0.00	82.0	152.6	83.8	81.0
507			0.089	0.59	78.2	4.59	-	3.22	-0.01	82.0	152.2	83.9	81.0
508	429.570	0.190	0.089	0.70	78.2	4.60	99	3.22	0.00	81.9	152.0	83.9	81.0
Avg/Tot	95.808	0.189	0.087	0.57	78.4	2.33	100			89.9	247.9	84.7	83.1

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	411.003		0.38	76.4	0.00		82.7	0.086	4.20	0.067	18.9	56.7
1			0.39	76.8	0.60	-	84.5	0.083	2.34	0.113	18.9	56.7
2			0.39	76.8	0.76	-	84.4	0.096	3.73	0.476	18.9	56.7
3			0.39	76.9	0.73	-	84.8	0.103	5.43	0.423	18.9	56.7
4			0.38	77.0	0.66	-	84.7	0.094	12.97	1.791	18.9	56.7
5			0.38	77.0	0.73	-	84.8	0.092	13.37	1.470	18.9	56.7
6			0.38	77.0	0.67	-	84.8	0.092	12.95	1.100	18.9	56.7
7			0.37	77.1	0.67	-	84.9	0.091	13.10	0.986	18.9	56.7
8			0.39	77.1	0.66	-	84.8	0.088	12.26	0.647	18.9	56.7
9			0.39	77.2	0.63	-	84.8	0.089	11.87	0.540	18.9	56.7
10	412.809	0.181	0.37	77.2	0.74	106	85.0	0.088	11.91	0.503	18.9	56.7
11			0.37	77.2	0.75	-	85.0	0.086	12.32	0.796	18.9	56.7
12			0.37	77.1	0.70	-	85.0	0.085	11.55	0.616	20.8	62.6
13			0.37	77.1	0.73	-	85.0	0.083	12.72	0.587	23.1	65.8
14			0.38	77.1	0.64	-	85.1	0.081	11.85	0.403	23.0	64.9
15			0.40	77.0	0.75	-	85.0	0.078	10.41	0.349	22.5	63.7
16			0.38	77.0	0.64	-	84.9	0.075	8.82	0.314	22.1	62.2
17			0.40	77.0	0.73	-	84.9	0.075	8.07	0.380	22.0	61.3
18			0.40	77.0	0.68	-	84.9	0.074	7.86	0.477	22.3	61.0
19			0.40	77.0	0.72	-	84.9	0.072	7.81	0.484	22.6	60.4
20	414.568	0.176	0.39	77.1	0.72	100	84.8	0.072	7.80	0.521	22.7	60.4
21			0.40	77.0	0.68	-	84.8	0.071	7.96	0.535	22.9	60.4
22			0.41	77.1	0.69	-	84.7	0.071	8.05	0.558	23.1	60.4
23			0.40	77.1	0.74	-	84.7	0.070	8.67	0.465	23.4	60.4
24			0.40	77.1	0.65	-	84.6	0.070	8.84	0.463	23.5	60.4
25			0.40	77.1	0.75	-	84.4	0.069	8.81	0.543	23.8	60.6
26			0.41	77.1	0.75	-	84.3	0.070	9.18	0.584	23.9	60.8
27			0.40	77.2	0.74	-	84.3	0.070	9.21	0.675	24.1	60.8
28			0.41	77.2	0.68	-	84.2	0.070	9.51	0.694	24.3	61.0
29			0.41	77.2	0.70	-	84.0	0.071	10.21	0.613	24.4	61.3
30	416.326	0.176	0.40	77.2	0.66	99	84.0	0.072	9.89	0.588	24.7	61.0
31			0.39	77.1	0.75	-	83.9	0.073	10.09	0.537	25.3	60.8
32			0.41	77.1	0.75	-	83.7	0.072	10.21	0.551	25.8	60.6
33			0.40	77.1	0.71	-	83.7	0.072	10.47	0.497	26.0	60.6
34			0.39	77.1	0.78	-	83.7	0.074	10.48	0.500	26.2	60.8
35			0.40	77.1	0.68	-	83.6	0.073	10.82	0.458	26.4	60.8
36			0.40	77.1	0.73	-	83.6	0.074	10.87	0.407	26.5	60.8
37			0.40	77.0	0.78	-	83.5	0.074	10.75	0.354	26.6	60.6
38			0.42	77.1	0.77	-	83.5	0.073	10.70	0.295	26.6	60.4

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.41	77.1	0.68	-	83.4	0.073	10.87	0.282	26.7	60.4
40	418.107	0.178	0.41	77.1	0.70	99	83.3	0.073	10.79	0.251	26.9	60.3
41			0.41	77.1	0.74	-	83.3	0.072	10.49	0.208	26.9	60.1
42			0.40	77.0	0.70	-	83.1	0.072	10.39	0.186	26.8	59.9
43			0.41	77.1	0.73	-	83.0	0.073	10.34	0.193	27.1	59.9
44			0.41	77.0	0.69	-	82.9	0.073	10.40	0.167	27.0	59.7
45			0.39	77.0	0.68	-	82.8	0.072	10.65	0.149	27.0	59.9
46			0.41	77.0	0.74	-	82.8	0.072	10.47	0.172	26.9	59.5
47			0.42	77.0	0.78	-	82.7	0.071	10.76	0.149	27.2	59.9
48			0.42	77.0	0.77	-	82.6	0.073	10.83	0.135	27.2	59.7
49			0.41	77.0	0.77	-	82.5	0.073	11.04	0.127	27.4	59.9
50	419.899	0.179	0.42	76.9	0.77	99	82.5	0.072	10.94	0.122	27.3	59.9
51			0.42	76.9	0.75	-	82.4	0.074	11.25	0.131	27.5	60.1
52			0.41	76.9	0.76	-	82.3	0.073	11.32	0.132	27.5	59.9
53			0.42	76.9	0.70	-	82.3	0.073	11.31	0.141	27.4	59.9
54			0.41	76.9	0.69	-	82.2	0.073	11.32	0.151	27.4	59.9
55			0.45	76.9	0.70	-	82.2	0.072	11.35	0.131	27.6	59.9
56			0.42	76.9	0.69	-	82.1	0.074	11.10	0.117	27.6	59.7
57			0.42	77.0	0.76	-	82.1	0.073	11.08	0.091	27.5	59.5
58			0.44	77.0	0.77	-	82.1	0.073	11.16	0.104	27.7	59.5
59			0.44	77.0	0.77	-	82.1	0.073	10.85	0.083	27.7	59.4
60	421.701	0.180	0.46	76.9	0.69	100	82.0	0.073	10.95	0.085	27.7	59.4
61			0.44	77.0	0.68	-	82.0	0.072	10.66	0.080	27.6	59.2
62			0.43	76.9	0.73	-	82.3	0.071	10.82	0.065	27.6	59.0
63			0.44	77.0	0.74	-	83.8	0.072	10.78	0.077	27.6	59.0
64			0.44	77.1	0.77	-	84.9	0.071	11.04	0.075	27.7	59.0
65			0.45	77.2	0.74	-	85.9	0.071	10.61	0.082	27.5	58.8
66			0.44	77.2	0.75	-	85.9	0.072	10.59	0.098	27.5	58.6
67			0.45	77.3	0.68	-	85.7	0.072	10.97	0.096	27.6	58.8
68			0.43	77.3	0.77	-	85.6	0.072	10.84	0.109	27.4	58.6
69			0.45	77.3	0.77	-	85.6	0.072	11.31	0.110	27.7	58.8
70	423.500	0.180	0.45	77.3	0.69	99	85.6	0.073	11.02	0.160	27.7	58.8
71			0.45	77.3	0.77	-	85.6	0.072	11.08	0.190	27.7	58.8
72			0.46	77.3	0.70	-	85.6	0.072	11.31	0.199	27.7	58.8
73			0.46	77.3	0.80	-	85.7	0.073	11.10	0.300	27.7	58.8
74			0.46	77.3	0.80	-	85.7	0.074	11.48	0.264	27.7	58.8
75			0.46	77.2	0.72	-	85.7	0.073	11.47	0.233	27.6	58.8
76			0.44	77.2	0.72	-	85.7	0.074	11.42	0.198	27.6	59.0
77			0.45	77.2	0.73	-	85.8	0.074	11.55	0.228	27.6	59.0

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.46	77.3	0.77	-	85.8	0.073	11.63	0.249	27.6	59.0
79			0.45	77.3	0.78	-	85.9	0.075	11.78	0.249	28.0	59.0
80	425.307	0.181	0.46	77.3	0.74	99	86.0	0.074	11.86	0.257	28.8	58.8
81			0.44	77.4	0.80	-	86.0	0.074	11.91	0.269	28.9	58.8
82			0.45	77.3	0.86	-	86.0	0.074	11.69	0.239	29.0	58.5
83			0.46	77.3	0.83	-	86.0	0.073	11.56	0.217	29.4	58.3
84			0.46	77.3	0.81	-	86.1	0.073	11.45	0.212	29.5	58.1
85			0.43	77.4	0.86	-	86.1	0.074	11.43	0.254	29.6	58.1
86			0.47	77.4	0.86	-	86.1	0.073	11.31	0.238	29.9	57.7
87			0.46	77.4	0.78	-	86.1	0.073	11.14	0.174	30.1	57.4
88			0.50	77.4	0.82	-	86.1	0.072	10.72	0.107	30.1	57.0
89			0.50	77.4	0.81	-	86.1	0.072	10.38	0.080	30.2	56.5
90	427.123	0.182	0.49	77.4	0.88	100	86.1	0.071	9.70	0.085	30.0	55.8
91			0.47	77.4	0.87	-	86.0	0.069	9.08	0.120	30.0	55.2
92			0.49	77.3	0.85	-	85.9	0.067	8.79	0.129	30.1	54.9
93			0.48	77.4	0.83	-	85.8	0.068	8.57	0.164	30.1	54.5
94			0.49	77.3	0.87	-	85.8	0.068	8.34	0.199	29.2	54.7
95			0.50	77.3	0.80	-	85.7	0.066	8.37	0.178	28.4	54.9
96			0.49	77.3	0.83	-	85.8	0.066	8.23	0.223	27.9	55.0
97			0.49	77.3	0.86	-	85.8	0.066	8.04	0.269	27.8	55.0
98			0.48	77.3	0.86	-	85.9	0.066	8.52	0.201	27.9	55.4
99			0.46	77.3	0.82	-	85.9	0.067	8.56	0.294	27.5	55.8
100	428.962	0.184	0.47	77.3	0.80	101	85.9	0.067	8.90	0.228	26.7	56.1
101			0.47	77.3	0.89	-	86.0	0.068	9.40	0.208	26.5	56.5
102			0.48	77.3	0.89	-	86.0	0.067	9.58	0.292	26.3	56.8
103			0.48	77.3	0.82	-	86.0	0.068	10.47	0.250	26.6	57.4
104			0.50	77.3	0.93	-	85.9	0.068	10.71	0.203	26.4	57.6
105			0.48	77.3	0.90	-	85.9	0.067	10.28	0.230	26.0	57.4
106			0.48	77.3	0.95	-	85.7	0.066	9.33	0.177	25.3	56.7
107			0.48	77.3	0.92	-	85.7	0.066	8.65	0.195	25.5	56.1
108			0.48	77.3	0.94	-	85.6	0.066	8.28	0.236	25.6	55.9
109			0.50	77.2	0.89	-	85.6	0.064	8.04	0.268	25.5	55.8
110	430.786	0.182	0.49	77.2	0.87	100	85.6	0.064	7.90	0.307	25.7	55.6
111			0.50	77.3	0.89	-	85.6	0.062	7.84	0.313	25.7	55.4
112			0.50	77.2	0.96	-	85.5	0.062	7.56	0.374	25.8	55.2
113			0.49	77.2	0.86	-	85.4	0.061	7.42	0.411	25.6	55.0
114			0.51	77.3	0.91	-	85.5	0.060	7.35	0.404	25.7	54.9
115			0.50	77.2	0.86	-	85.6	0.060	7.40	0.375	25.6	54.9
116			0.49	77.3	0.91	-	85.5	0.059	7.39	0.374	25.6	54.9

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.50	77.2	0.88	-	85.5	0.059	7.25	0.405	25.6	54.7
118			0.49	77.2	0.88	-	85.5	0.060	7.15	0.397	25.7	54.5
119			0.50	77.2	0.89	-	85.4	0.058	7.10	0.404	25.8	54.3
120	432.618	0.183	0.52	77.2	0.93	100	85.4	0.057	7.13	0.412	25.6	54.5
121			0.50	77.2	0.87	-	85.4	0.059	7.15	0.397	25.7	54.3
122			0.49	77.2	0.89	-	85.4	0.057	7.09	0.406	25.8	54.3
123			0.51	77.2	0.94	-	85.4	0.058	7.18	0.406	25.9	54.3
124			0.49	77.2	0.95	-	85.3	0.057	6.83	0.428	25.8	54.1
125			0.50	77.2	0.89	-	85.3	0.053	6.31	0.498	25.5	53.8
126			0.51	77.2	0.88	-	85.3	0.053	5.84	0.673	26.1	53.1
127			0.50	77.1	0.98	-	85.3	0.054	5.44	0.834	26.9	52.9
128			0.51	77.2	0.91	-	85.2	0.051	5.33	0.909	27.2	52.9
129			0.51	77.1	0.99	-	85.1	0.051	5.25	0.992	27.5	52.7
130	434.435	0.182	0.51	77.2	1.06	99	85.0	0.051	5.26	1.020	27.5	52.7
131			0.50	77.2	1.06	-	85.0	0.050	5.65	0.929	27.7	52.9
132			0.49	77.2	0.98	-	84.9	0.050	5.59	0.914	27.2	53.2
133			0.51	77.2	1.06	-	84.9	0.049	5.23	1.007	26.0	53.4
134			0.49	77.2	1.03	-	84.9	0.049	5.25	1.017	26.1	53.4
135			0.50	77.2	1.08	-	84.9	0.048	5.33	0.990	26.3	53.2
136			0.50	77.2	1.07	-	84.9	0.049	5.59	0.941	26.3	53.2
137			0.49	77.3	1.13	-	84.8	0.048	5.67	0.946	26.6	53.1
138			0.52	77.3	1.12	-	84.8	0.047	5.55	1.019	26.7	53.1
139			0.49	77.3	1.14	-	84.8	0.046	5.55	1.029	26.4	53.1
140	436.271	0.184	0.49	77.3	1.24	100	84.8	0.047	5.53	1.043	26.2	53.2
141			0.49	77.3	1.17	-	84.7	0.046	5.68	0.960	26.1	53.2
142			0.50	77.2	1.22	-	84.7	0.046	5.55	1.024	26.1	53.2
143			0.49	77.2	1.21	-	84.7	0.046	5.85	0.951	27.2	52.9
144			0.51	77.3	1.19	-	84.7	0.045	5.74	1.057	28.1	52.7
145			0.50	77.3	1.28	-	84.6	0.045	5.76	1.056	28.4	52.7
146			0.48	77.3	1.33	-	84.7	0.045	5.80	1.036	28.5	52.7
147			0.48	77.3	1.40	-	84.6	0.046	5.79	1.057	27.3	53.2
148			0.49	77.3	1.35	-	84.7	0.045	5.74	1.046	26.4	53.2
149			0.50	77.3	1.38	-	84.7	0.045	5.77	1.047	26.3	53.2
150	438.100	0.183	0.48	77.3	1.43	100	84.6	0.044	5.78	1.040	26.4	53.2
151			0.50	77.3	1.38	-	84.6	0.044	5.94	1.061	27.8	52.7
152			0.50	77.3	1.53	-	84.5	0.044	5.96	1.061	28.3	52.7
153			0.49	77.3	1.47	-	84.5	0.044	5.95	1.070	27.8	53.1
154			0.50	77.3	1.56	-	84.5	0.044	5.84	1.042	26.6	53.1
155			0.49	77.3	1.56	-	84.5	0.043	5.80	1.018	26.4	53.1

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
156			0.50	77.3	1.57	-	84.5	0.043	5.91	1.041	27.3	52.7
157			0.51	77.3	1.61	-	84.4	0.043	5.87	1.033	27.0	52.9
158			0.52	77.3	1.58	-	84.5	0.044	5.90	1.026	26.8	52.9
159			0.51	77.3	1.63	-	84.4	0.043	5.95	1.054	26.6	53.1
160	439.935	0.183	0.50	77.3	1.68	100	84.4	0.043	5.90	1.044	26.3	53.1
161			0.50	77.3	1.62	-	84.5	0.043	5.86	1.015	26.2	52.9
162			0.51	77.3	1.69	-	84.4	0.043	5.79	1.007	26.5	52.7
163			0.50	77.3	1.69	-	84.5	0.044	5.73	0.939	26.4	52.5
164			0.50	77.3	1.59	-	84.5	0.043	5.61	0.857	26.0	52.3
165			0.50	77.3	1.60	-	84.5	0.043	5.67	0.839	25.9	52.3
166			0.50	77.3	1.60	-	84.6	0.043	5.65	0.814	25.9	52.3
167			0.49	77.4	1.60	-	84.6	0.042	5.71	0.794	25.8	52.3
168			0.50	77.4	1.57	-	84.6	0.042	5.65	0.785	25.8	52.2
169			0.49	77.4	1.57	-	84.6	0.042	5.68	0.769	25.8	52.2
170	441.783	0.185	0.52	77.4	1.64	100	84.6	0.042	5.57	0.784	25.8	52.2
171			0.50	77.4	1.64	-	84.6	0.042	5.41	0.805	25.8	52.2
172			0.51	77.4	1.61	-	84.7	0.042	5.41	0.787	26.2	52.0
173			0.52	77.4	1.60	-	84.6	0.042	5.41	0.788	26.3	51.8
174			0.51	77.4	1.58	-	84.6	0.042	5.42	0.781	26.3	51.8
175			0.51	77.3	1.60	-	84.6	0.042	5.40	0.777	26.3	51.8
176			0.51	77.3	1.55	-	84.7	0.041	5.45	0.769	26.3	51.8
177			0.49	77.3	1.58	-	84.5	0.041	5.44	0.773	26.3	51.8
178			0.50	77.3	1.56	-	84.5	0.041	5.47	0.777	26.3	51.8
179			0.48	77.3	1.62	-	84.5	0.041	5.42	0.761	26.3	51.8
180	443.659	0.188	0.47	77.3	1.58	102	84.5	0.041	5.47	0.756	26.4	51.8
181			0.50	77.3	1.56	-	84.6	0.041	5.43	0.747	26.4	51.8
182			0.49	77.3	1.55	-	84.5	0.041	5.47	0.744	26.3	51.8
183			0.49	77.3	1.59	-	84.5	0.041	5.21	0.729	26.2	51.8
184			0.49	77.3	1.62	-	84.5	0.041	4.97	0.692	26.0	51.8
185			0.50	77.4	1.63	-	84.6	0.041	4.85	0.679	26.0	51.8
186			0.50	77.4	1.54	-	84.5	0.040	4.81	0.674	26.7	51.6
187			0.51	77.3	1.63	-	84.5	0.040	4.82	0.671	27.1	51.4
188			0.51	77.3	1.63	-	84.5	0.040	4.81	0.661	27.2	51.4
189			0.49	77.3	1.54	-	84.4	0.039	4.79	0.651	27.4	51.3
190	445.536	0.188	0.49	77.3	1.54	102	84.4	0.039	4.80	0.655	27.6	51.3
191			0.51	77.3	1.55	-	84.4	0.039	4.80	0.648	27.8	51.3
192			0.51	77.3	1.54	-	84.4	0.039	4.83	0.648	27.8	51.3
193			0.51	77.3	1.59	-	84.3	0.039	4.81	0.645	28.0	51.3
194			0.50	77.3	1.63	-	84.3	0.038	4.82	0.645	28.1	51.3



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
195			0.52	77.4	1.60	-	84.3	0.039	4.82	0.638	28.3	51.3
196			0.49	77.4	1.60	-	84.2	0.038	4.74	0.649	28.3	51.3
197			0.49	77.4	1.58	-	84.2	0.038	4.74	0.646	28.4	51.3
198			0.47	77.4	1.54	-	84.3	0.038	4.72	0.641	28.5	51.1
199			0.46	77.4	1.56	-	84.2	0.038	4.73	0.639	28.5	51.1
200	447.411	0.188	0.48	77.3	1.62	101	84.2	0.038	4.71	0.637	28.7	51.1
201			0.49	77.4	1.59	-	84.2	0.038	4.72	0.638	28.7	51.1
202			0.49	77.4	1.53	-	84.2	0.038	4.71	0.635	28.8	51.1
203			0.47	77.4	1.57	-	84.1	0.038	4.71	0.631	28.9	51.1
204			0.47	77.4	1.57	-	84.2	0.038	4.71	0.637	28.9	51.1
205			0.50	77.4	1.61	-	84.1	0.037	4.71	0.631	29.0	51.1
206			0.45	77.3	1.53	-	84.1	0.037	4.69	0.632	29.1	51.1
207			0.47	77.3	1.59	-	84.1	0.037	4.63	0.654	29.1	51.1
208			0.49	77.3	1.58	-	84.0	0.037	4.62	0.651	29.1	51.1
209			0.49	77.3	1.55	-	84.0	0.037	4.59	0.645	29.2	51.1
210	449.275	0.186	0.40	77.3	1.59	100	84.1	0.037	4.59	0.637	29.3	51.1
211			0.44	77.2	1.58	-	84.0	0.036	4.59	0.637	29.3	51.1
212			0.40	77.2	1.59	-	83.9	0.036	4.59	0.639	29.4	51.1
213			0.53	77.2	1.55	-	83.9	0.036	4.60	0.638	29.4	51.1
214			0.53	77.2	1.62	-	83.9	0.036	4.61	0.639	29.4	51.1
215			0.51	77.2	1.63	-	83.8	0.036	4.59	0.631	29.5	51.1
216			0.46	77.2	1.63	-	83.7	0.036	4.57	0.628	29.5	51.1
217			0.39	77.2	1.64	-	83.8	0.036	4.54	0.640	29.5	50.9
218			0.44	77.2	1.64	-	83.7	0.035	4.50	0.651	29.6	50.9
219			0.46	77.2	1.56	-	83.7	0.036	4.52	0.653	29.7	50.9
220	451.142	0.187	0.41	77.2	1.59	100	83.7	0.035	4.53	0.657	29.7	50.9
221			0.46	77.2	1.56	-	83.7	0.035	4.50	0.649	29.7	50.9
222			0.46	77.2	1.56	-	83.7	0.035	4.53	0.651	29.8	50.9
223			0.42	77.2	1.58	-	83.6	0.035	4.53	0.652	29.8	50.9
224			0.44	77.2	1.56	-	83.6	0.035	4.56	0.662	29.8	50.9
225			0.41	77.2	1.57	-	83.6	0.035	4.57	0.660	29.8	50.9
226			0.45	77.1	1.64	-	83.6	0.035	4.57	0.658	29.8	50.9
227			0.47	77.1	1.64	-	83.6	0.035	4.55	0.651	29.9	50.9
228			0.46	77.1	1.63	-	83.6	0.034	4.54	0.646	29.9	50.9
229			0.42	77.1	1.65	-	83.6	0.035	4.53	0.642	30.0	50.9
230	453.002	0.186	0.45	77.1	1.57	100	83.6	0.035	4.53	0.642	30.0	50.9
231			0.45	77.1	1.63	-	83.5	0.034	4.53	0.638	30.0	50.9
232			0.44	77.1	1.64	-	83.6	0.034	4.51	0.631	30.1	50.9
233			0.43	77.1	1.65	-	83.5	0.034	4.39	0.623	30.0	50.9

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
234			0.46	77.1	1.61	-	83.6	0.034	4.38	0.622	30.1	50.7
235			0.44	77.2	1.61	-	83.5	0.033	4.37	0.619	30.2	50.7
236			0.42	77.3	1.65	-	83.5	0.034	4.35	0.615	30.2	50.7
237			0.45	77.3	1.62	-	83.5	0.034	4.36	0.614	30.2	50.9
238			0.42	77.3	1.66	-	83.5	0.034	4.35	0.612	30.3	50.9
239			0.39	77.3	1.58	-	83.5	0.034	4.35	0.612	30.4	50.9
240	454.860	0.186	0.46	77.3	1.66	100	83.5	0.033	4.35	0.612	30.3	50.9
241			0.42	77.3	1.59	-	83.4	0.033	4.32	0.607	30.3	50.9
242			0.38	77.3	1.67	-	83.4	0.033	4.33	0.611	30.3	50.9
243			0.42	77.3	1.65	-	83.4	0.033	4.25	0.611	30.3	50.9
244			0.39	77.3	1.66	-	83.3	0.033	4.23	0.615	30.4	50.9
245			0.42	77.3	1.62	-	83.3	0.033	4.22	0.617	30.4	50.9
246			0.38	77.3	1.64	-	83.3	0.033	4.21	0.614	30.5	50.9
247			0.38	77.2	1.65	-	83.3	0.033	4.19	0.610	30.5	50.7
248			0.39	77.2	1.66	-	83.3	0.033	4.18	0.607	30.5	50.7
249			0.41	77.2	1.68	-	83.3	0.033	4.23	0.617	30.6	50.7
250	456.718	0.186	0.41	77.2	1.69	100	83.3	0.033	4.17	0.613	30.6	50.7
251			0.38	77.2	1.68	-	83.3	0.032	3.93	0.588	30.6	50.7
252			0.41	77.2	1.61	-	83.3	0.032	3.90	0.621	30.6	50.7
253			0.38	77.2	1.62	-	83.2	0.032	3.88	0.620	30.6	50.7
254			0.40	77.2	1.70	-	83.2	0.032	3.87	0.615	30.7	50.7
255			0.41	77.2	1.70	-	83.2	0.032	3.85	0.608	30.7	50.7
256			0.40	77.2	1.66	-	83.2	0.032	3.81	0.599	30.7	50.7
257			0.45	77.1	1.70	-	83.2	0.031	3.80	0.597	30.8	50.7
258			0.39	77.1	1.70	-	83.1	0.032	3.78	0.593	30.8	50.7
259			0.41	77.1	1.67	-	83.2	0.032	3.78	0.591	30.9	50.7
260	458.568	0.185	0.45	77.1	1.63	99	83.2	0.031	3.76	0.591	30.9	50.7
261			0.43	77.1	1.71	-	83.2	0.031	3.73	0.592	30.9	50.7
262			0.38	77.1	1.71	-	83.2	0.031	3.72	0.589	31.0	50.7
263			0.39	77.1	1.74	-	83.1	0.031	3.75	0.595	31.0	50.7
264			0.46	77.1	1.75	-	83.1	0.031	3.71	0.590	31.1	50.7
265			0.41	77.1	1.75	-	83.1	0.031	3.71	0.587	31.1	50.7
266			0.41	77.1	1.70	-	83.1	0.031	3.71	0.586	31.1	50.7
267			0.41	77.1	1.68	-	83.2	0.031	3.66	0.596	31.2	50.7
268			0.41	77.1	1.71	-	83.1	0.030	3.70	0.629	31.2	50.7
269			0.41	77.0	1.68	-	83.1	0.031	3.69	0.624	31.3	50.7
270	460.440	0.187	0.38	77.0	1.70	100	83.1	0.030	3.69	0.617	31.3	50.7
271			0.41	77.1	1.70	-	83.1	0.031	3.68	0.608	31.4	50.7
272			0.38	77.1	1.72	-	83.0	0.030	3.65	0.598	31.4	50.7

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
273			0.40	77.1	1.69	-	83.0	0.030	3.69	0.600	31.4	50.7
274			0.41	77.0	1.71	-	83.0	0.030	3.70	0.596	31.4	50.7
275			0.40	77.0	1.70	-	82.9	0.029	3.68	0.592	31.5	50.7
276			0.37	77.0	1.72	-	82.9	0.030	3.69	0.593	31.5	50.7
277			0.41	77.0	1.78	-	83.0	0.030	3.69	0.589	31.5	50.7
278			0.39	76.9	1.70	-	83.0	0.030	3.70	0.593	31.5	50.7
279			0.44	76.9	1.72	-	82.9	0.029	3.67	0.587	31.6	50.7
280	462.308	0.187	0.44	76.9	1.77	100	82.9	0.029	3.69	0.587	31.6	50.7
281			0.41	76.9	1.77	-	82.9	0.030	3.67	0.586	31.6	50.7
282			0.45	77.0	1.74	-	82.8	0.029	3.66	0.581	31.7	50.7
283			0.42	76.9	1.81	-	82.9	0.029	3.68	0.585	31.7	50.7
284			0.42	76.9	1.79	-	82.8	0.029	3.70	0.589	31.8	50.7
285			0.40	76.9	1.78	-	82.8	0.029	3.70	0.590	31.8	50.7
286			0.42	76.9	1.80	-	82.9	0.029	3.70	0.591	31.8	50.7
287			0.39	76.9	1.79	-	82.9	0.028	3.70	0.590	31.9	50.7
288			0.38	76.9	1.75	-	82.8	0.028	3.69	0.588	31.9	50.7
289			0.40	76.9	1.82	-	82.8	0.029	3.71	0.587	32.0	50.7
290	464.183	0.188	0.37	76.9	1.76	100	82.8	0.029	3.70	0.589	32.0	50.7
291			0.37	76.9	1.77	-	82.9	0.029	3.70	0.592	32.0	50.7
292			0.37	76.9	1.80	-	82.8	0.029	3.68	0.593	32.0	50.7
293			0.39	76.9	1.76	-	82.8	0.029	3.69	0.605	32.1	50.7
294			0.42	76.9	1.77	-	82.8	0.028	3.68	0.601	32.1	50.7
295			0.41	76.9	1.79	-	82.8	0.028	3.67	0.600	32.1	50.7
296			0.43	76.9	1.78	-	82.8	0.029	3.67	0.600	32.2	50.7
297			0.41	76.9	1.84	-	82.7	0.029	3.68	0.600	32.2	50.7
298			0.42	76.9	1.82	-	82.7	0.029	3.67	0.598	32.2	50.7
299			0.41	76.9	1.82	-	82.7	0.028	3.66	0.596	32.3	50.7
300	466.031	0.185	0.40	76.9	1.84	99	82.7	0.028	3.67	0.597	32.2	50.7
301			0.48	76.9	1.87	-	82.7	0.028	3.67	0.600	32.3	50.9
302			0.43	76.8	1.90	-	82.7	0.028	3.67	0.600	32.3	50.7
303			0.41	76.9	1.88	-	82.7	0.028	3.67	0.587	32.4	50.9
304			0.41	76.9	1.90	-	82.6	0.028	3.68	0.588	32.4	50.9
305			0.45	76.9	1.84	-	82.7	0.028	3.74	0.622	32.4	50.9
306			0.45	76.9	1.84	-	82.7	0.028	3.73	0.618	32.5	50.9
307			0.43	76.9	1.91	-	82.7	0.028	3.71	0.611	32.5	50.9
308			0.44	76.9	1.90	-	82.7	0.028	3.73	0.616	32.6	50.9
309			0.42	76.8	1.91	-	82.7	0.028	3.73	0.618	32.5	50.9
310	467.903	0.187	0.42	76.8	1.88	100	82.6	0.028	3.74	0.621	32.6	50.9
311			0.43	76.8	1.85	-	82.5	0.028	3.75	0.622	32.6	50.9

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
312			0.42	76.8	1.87	-	82.7	0.028	3.75	0.618	32.6	50.9
313			0.40	76.8	1.85	-	82.8	0.028	3.77	0.618	32.7	50.9
314			0.42	76.8	1.94	-	83.0	0.028	3.78	0.619	32.7	50.9
315			0.43	76.9	1.89	-	83.1	0.028	3.79	0.618	32.8	50.9
316			0.44	76.9	1.94	-	83.2	0.028	3.80	0.617	32.8	50.9
317			0.48	76.9	1.87	-	83.2	0.028	3.80	0.615	32.8	50.9
318			0.44	76.9	1.87	-	83.4	0.028	3.78	0.613	32.8	50.9
319			0.46	76.8	1.93	-	83.5	0.028	3.78	0.611	32.8	50.9
320	469.763	0.186	0.49	76.8	1.96	100	83.5	0.028	3.80	0.612	32.9	50.9
321			0.44	76.8	1.90	-	83.6	0.028	3.81	0.613	32.9	50.9
322			0.48	76.8	1.93	-	83.7	0.028	3.82	0.614	32.9	50.9
323			0.47	76.8	1.94	-	83.8	0.028	3.82	0.613	32.9	50.9
324			0.44	76.8	2.00	-	83.8	0.028	3.83	0.611	32.9	50.9
325			0.44	76.7	1.99	-	83.9	0.028	3.85	0.612	32.9	50.9
326			0.46	76.7	2.00	-	83.9	0.028	3.82	0.604	32.9	50.9
327			0.45	76.8	2.00	-	84.0	0.028	3.81	0.605	33.0	50.9
328			0.45	76.7	2.01	-	84.0	0.028	3.81	0.601	33.0	50.9
329			0.42	76.7	2.02	-	84.1	0.028	3.83	0.602	33.0	50.9
330	471.633	0.187	0.45	76.7	1.97	100	84.2	0.028	3.83	0.601	33.1	50.9
331			0.50	76.7	2.04	-	84.3	0.028	3.83	0.599	33.0	50.9
332			0.45	76.8	1.98	-	84.3	0.027	3.82	0.596	33.0	50.9
333			0.45	76.8	1.98	-	84.4	0.028	3.83	0.595	33.1	50.9
334			0.48	76.7	2.03	-	84.4	0.028	3.83	0.593	33.1	50.9
335			0.46	76.7	2.01	-	84.4	0.028	3.87	0.598	33.1	50.9
336			0.45	76.7	2.07	-	84.6	0.028	3.83	0.590	33.1	50.9
337			0.45	76.7	2.08	-	84.6	0.028	3.83	0.587	33.1	50.9
338			0.46	76.7	2.03	-	84.5	0.028	3.83	0.587	33.2	50.9
339			0.45	76.7	2.08	-	84.6	0.028	3.84	0.587	33.2	50.9
340	473.498	0.187	0.44	76.7	2.09	100	84.6	0.027	3.82	0.581	33.2	50.9
341			0.46	76.7	2.08	-	84.7	0.027	3.83	0.580	33.2	50.9
342			0.43	76.7	2.02	-	84.7	0.027	3.84	0.580	33.2	50.9
343			0.39	76.7	2.08	-	84.7	0.027	3.86	0.581	33.2	50.9
344			0.45	76.6	2.07	-	84.7	0.028	3.83	0.578	33.2	50.9
345			0.42	76.7	2.07	-	84.8	0.028	3.82	0.585	33.2	50.9
346			0.43	76.6	2.07	-	84.8	0.028	3.83	0.591	33.3	50.9
347			0.39	76.7	2.11	-	84.9	0.027	3.85	0.591	33.3	50.9
348			0.42	76.7	2.11	-	85.0	0.027	3.86	0.591	33.3	50.9
349			0.47	76.7	2.13	-	84.9	0.027	3.83	0.588	33.3	50.9
350	475.349	0.185	0.43	76.7	2.13	99	85.0	0.027	3.87	0.591	33.3	50.9

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
351			0.43	76.7	2.12	-	85.0	0.028	3.89	0.594	33.3	50.9
352			0.46	76.7	2.13	-	85.0	0.027	3.91	0.600	33.3	51.1
353			0.46	76.8	2.16	-	84.9	0.028	3.90	0.596	33.3	50.9
354			0.44	76.8	2.20	-	85.0	0.028	3.91	0.594	33.3	51.1
355			0.44	76.8	2.21	-	85.0	0.028	3.88	0.595	33.3	51.1
356			0.47	76.8	2.19	-	85.1	0.028	3.89	0.596	33.3	51.1
357			0.45	76.8	2.14	-	85.0	0.027	3.88	0.590	33.4	50.9
358			0.50	76.9	2.22	-	85.0	0.028	3.88	0.588	33.4	50.9
359			0.46	76.8	2.22	-	85.0	0.028	3.88	0.586	33.4	51.1
360	477.223	0.187	0.48	76.8	2.21	100	85.1	0.028	3.88	0.584	33.4	50.9
361			0.52	76.8	2.17	-	85.1	0.028	3.87	0.582	33.4	51.1
362			0.46	76.9	2.17	-	85.1	0.028	3.89	0.580	33.5	51.1
363			0.51	76.8	2.17	-	85.1	0.028	3.88	0.577	33.4	51.1
364			0.49	76.8	2.24	-	85.1	0.028	3.87	0.571	33.4	50.9
365			0.51	76.8	2.21	-	85.0	0.028	3.86	0.567	33.4	51.1
366			0.51	76.8	2.18	-	85.1	0.028	3.85	0.571	33.5	51.1
367			0.39	76.8	2.19	-	85.0	0.027	3.84	0.563	33.5	51.1
368			0.47	76.8	2.26	-	85.1	0.027	3.85	0.564	33.5	51.1
369			0.47	76.8	2.28	-	85.1	0.027	3.84	0.559	33.5	51.1
370	479.088	0.187	0.43	76.8	2.24	100	85.0	0.028	3.84	0.555	33.5	51.1
371			0.44	76.8	2.28	-	85.1	0.027	3.82	0.550	33.5	51.1
372			0.48	76.8	2.32	-	85.1	0.027	3.82	0.547	33.5	51.1
373			0.47	76.8	2.33	-	85.1	0.027	3.84	0.547	33.6	51.1
374			0.46	76.9	2.26	-	85.1	0.027	3.83	0.543	33.6	51.1
375			0.46	76.9	2.32	-	85.1	0.027	3.84	0.542	33.6	51.1
376			0.46	77.0	2.33	-	85.1	0.028	3.84	0.538	33.6	51.1
377			0.49	77.1	2.29	-	85.1	0.028	3.85	0.537	33.6	51.1
378			0.46	77.2	2.33	-	85.1	0.028	3.85	0.534	33.6	51.1
379			0.47	77.2	2.29	-	85.1	0.028	3.82	0.529	33.6	51.1
380	480.962	0.187	0.50	77.3	2.31	100	85.1	0.027	3.82	0.527	33.6	51.1
381			0.51	77.2	2.38	-	85.1	0.028	3.81	0.529	33.7	51.1
382			0.51	77.2	2.33	-	85.1	0.027	3.84	0.531	33.7	51.1
383			0.48	77.2	2.33	-	85.0	0.027	3.83	0.525	33.6	51.1
384			0.49	77.2	2.40	-	85.1	0.027	3.83	0.523	33.7	51.1
385			0.49	77.1	2.34	-	85.1	0.028	3.82	0.518	33.7	51.1
386			0.49	77.1	2.38	-	85.2	0.027	3.83	0.516	33.7	51.1
387			0.48	77.1	2.34	-	85.1	0.027	3.84	0.516	33.7	51.1
388			0.49	77.1	2.35	-	85.1	0.027	3.85	0.515	33.7	51.1
389			0.46	77.1	2.35	-	85.1	0.027	3.85	0.513	33.7	51.1

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
390	482.830	0.187	0.44	77.0	2.41	100	85.0	0.028	3.83	0.512	33.7	51.1
391			0.49	77.0	2.43	-	84.9	0.027	3.78	0.501	33.8	51.1
392			0.45	77.0	2.47	-	84.9	0.027	3.78	0.497	33.7	51.1
393			0.47	77.0	2.42	-	84.8	0.027	3.78	0.511	33.8	51.1
394			0.49	77.1	2.42	-	84.8	0.027	3.77	0.511	33.8	51.1
395			0.50	77.1	2.41	-	84.8	0.027	3.76	0.511	33.8	51.1
396			0.46	77.0	2.44	-	84.8	0.027	3.72	0.503	33.8	51.1
397			0.44	77.0	2.48	-	84.8	0.027	3.72	0.502	33.8	51.1
398			0.41	77.0	2.42	-	84.7	0.027	3.70	0.500	33.8	51.1
399			0.47	77.0	2.43	-	84.8	0.027	3.72	0.499	33.8	51.1
400	484.700	0.187	0.46	77.0	2.49	100	84.7	0.027	3.68	0.495	33.8	51.1
401			0.41	77.0	2.50	-	84.8	0.027	3.68	0.493	33.8	51.1
402			0.44	77.0	2.52	-	84.7	0.027	3.67	0.493	33.8	51.1
403			0.44	77.0	2.48	-	84.7	0.027	3.61	0.489	33.8	51.1
404			0.42	77.0	2.55	-	84.7	0.027	3.60	0.490	33.9	51.1
405			0.47	77.0	2.55	-	84.7	0.027	3.59	0.489	33.9	51.1
406			0.43	77.0	2.49	-	84.7	0.027	3.58	0.488	33.9	51.1
407			0.46	77.0	2.56	-	84.7	0.027	3.59	0.487	33.9	51.1
408			0.43	77.0	2.51	-	84.7	0.027	3.58	0.486	33.9	51.1
409			0.43	77.0	2.57	-	84.7	0.027	3.58	0.484	33.9	51.1
410	486.565	0.187	0.41	76.9	2.53	100	84.7	0.027	3.57	0.484	33.9	51.1
411			0.46	77.0	2.59	-	84.7	0.027	3.57	0.483	33.9	51.1
412			0.47	77.0	2.61	-	84.7	0.027	3.57	0.484	33.9	51.1
413			0.43	76.9	2.56	-	84.6	0.026	3.57	0.489	33.9	51.1
414			0.46	77.0	2.59	-	84.7	0.027	3.56	0.485	33.9	51.1
415			0.45	76.9	2.60	-	84.6	0.027	3.55	0.484	33.9	51.1
416			0.45	76.9	2.57	-	84.5	0.027	3.63	0.483	33.9	51.1
417			0.45	76.9	2.53	-	84.6	0.027	3.62	0.472	34.0	51.1
418			0.46	76.9	2.55	-	84.5	0.026	3.62	0.468	34.0	51.1
419			0.50	76.9	2.55	-	84.4	0.026	3.61	0.464	34.0	51.1
420	488.419	0.185	0.52	76.9	2.60	99	84.3	0.026	3.61	0.463	34.0	51.1
421			0.45	76.9	2.55	-	84.3	0.026	3.59	0.461	34.0	51.1
422			0.53	77.0	2.68	-	84.3	0.026	3.59	0.460	34.0	51.1
423			0.46	77.0	2.63	-	84.3	0.027	3.59	0.458	34.0	51.1
424			0.47	77.0	2.69	-	84.1	0.027	3.60	0.460	34.0	51.1
425			0.46	76.9	2.67	-	84.1	0.026	3.59	0.459	34.0	51.1
426			0.49	76.9	2.69	-	84.1	0.026	3.59	0.458	34.0	51.1
427			0.50	76.9	2.69	-	84.0	0.026	3.58	0.458	34.0	51.1
428			0.43	76.9	2.73	-	83.9	0.025	3.59	0.459	34.1	51.1

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
429			0.47	76.9	2.68	-	84.0	0.026	3.60	0.459	34.1	51.1
430	490.285	0.187	0.47	76.9	2.67	100	84.0	0.026	3.59	0.459	34.1	51.1
431			0.43	76.9	2.68	-	83.9	0.026	3.56	0.459	34.1	51.1
432			0.47	76.9	2.70	-	83.9	0.026	3.57	0.461	34.1	51.1
433			0.45	76.9	2.72	-	83.8	0.026	3.54	0.462	34.1	51.1
434			0.47	76.9	2.71	-	83.8	0.026	3.53	0.460	34.1	51.1
435			0.49	76.9	2.78	-	83.7	0.026	3.54	0.464	34.1	51.1
436			0.46	76.9	2.72	-	83.7	0.026	3.53	0.461	34.1	51.1
437			0.44	76.8	2.78	-	83.7	0.026	3.52	0.458	34.1	51.1
438			0.45	76.9	2.80	-	83.7	0.026	3.52	0.460	34.1	50.9
439			0.45	76.8	2.74	-	83.7	0.026	3.51	0.460	34.1	50.9
440	492.142	0.186	0.46	76.8	2.79	99	83.6	0.026	3.50	0.459	34.1	50.9
441			0.45	76.9	2.75	-	83.6	0.026	3.52	0.474	34.2	50.9
442			0.45	76.9	2.85	-	83.4	0.026	3.49	0.477	34.2	50.9
443			0.47	76.8	2.85	-	83.5	0.026	3.42	0.475	34.2	50.9
444			0.47	76.9	2.86	-	83.4	0.026	3.42	0.471	34.2	51.1
445			0.46	76.9	2.79	-	83.4	0.026	3.43	0.468	34.2	51.1
446			0.49	76.9	2.83	-	83.4	0.025	3.44	0.465	34.2	51.1
447			0.48	76.9	2.87	-	83.5	0.026	3.45	0.462	34.2	50.9
448			0.40	76.9	2.85	-	83.5	0.025	3.43	0.457	34.2	50.9
449			0.42	76.9	2.86	-	83.4	0.026	3.43	0.455	34.2	50.9
450	494.002	0.186	0.43	76.9	2.82	99	83.4	0.025	3.41	0.452	34.2	50.9
451			0.47	76.9	2.85	-	83.4	0.025	3.42	0.453	34.2	50.9
452			0.43	76.9	2.86	-	83.3	0.025	3.41	0.450	34.2	50.9
453			0.47	76.9	2.88	-	83.3	0.025	3.39	0.456	34.2	50.9
454			0.47	76.9	2.92	-	83.4	0.026	3.38	0.449	34.2	50.9
455			0.49	77.0	2.90	-	83.4	0.025	3.37	0.446	34.3	50.9
456			0.40	77.0	2.92	-	83.4	0.025	3.36	0.443	34.3	50.9
457			0.48	77.0	2.91	-	83.4	0.025	3.35	0.438	34.3	50.9
458			0.52	76.9	2.92	-	83.3	0.026	3.36	0.439	34.3	50.9
459			0.48	76.9	2.95	-	83.3	0.025	3.35	0.436	34.3	50.9
460	495.874	0.187	0.37	76.9	2.95	100	83.3	0.025	3.34	0.436	34.3	50.9
461			0.45	76.9	2.99	-	83.3	0.025	3.34	0.435	34.3	50.9
462			0.44	76.9	3.00	-	83.2	0.026	3.32	0.434	34.3	50.9
463			0.44	76.9	2.99	-	83.2	0.025	3.33	0.434	34.3	50.9
464			0.45	76.9	2.97	-	83.3	0.025	3.31	0.431	34.3	50.9
465			0.44	76.9	2.96	-	83.2	0.025	3.30	0.431	34.3	50.9
466			0.48	76.9	2.98	-	83.3	0.025	3.28	0.428	34.3	50.9
467			0.50	76.9	2.99	-	83.3	0.025	3.28	0.428	34.3	50.9

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
468			0.48	76.9	3.07	-	83.2	0.025	3.28	0.427	34.3	50.9
469			0.47	76.9	3.06	-	83.2	0.024	3.19	0.438	34.3	50.9
470	497.736	0.186	0.43	76.9	3.09	99	83.2	0.025	3.16	0.443	34.3	50.9
471			0.43	76.9	3.05	-	83.2	0.025	3.15	0.441	34.3	50.9
472			0.49	76.9	3.03	-	83.2	0.025	3.12	0.437	34.4	50.9
473			0.46	76.9	3.04	-	83.1	0.025	3.12	0.437	34.4	50.9
474			0.45	76.9	3.10	-	83.1	0.025	3.08	0.434	34.4	50.9
475			0.48	76.9	3.12	-	83.2	0.025	2.99	0.440	34.4	50.7
476			0.44	76.8	3.12	-	83.2	0.025	2.99	0.452	34.3	50.9
477			0.46	76.9	3.10	-	83.1	0.025	3.00	0.454	34.4	50.9
478			0.44	76.8	3.13	-	83.1	0.024	3.00	0.453	34.4	50.9
479			0.50	76.9	3.09	-	83.1	0.024	2.99	0.450	34.4	50.7
480	499.602	0.187	0.45	76.9	3.17	100	83.1	0.025	2.99	0.446	34.4	50.7
481			0.46	76.9	3.21	-	83.1	0.025	2.98	0.443	34.4	50.7
482			0.51	76.9	3.21	-	83.1	0.024	2.97	0.439	34.4	50.7
483			0.51	76.9	3.16	-	83.2	0.025	2.96	0.437	34.4	50.7
484			0.50	76.8	3.19	-	83.1	0.025	2.92	0.441	34.4	50.7
485			0.43	76.9	3.19	-	83.1	0.024	2.93	0.444	34.4	50.7
486			0.50	76.9	3.19	-	83.1	0.025	2.91	0.441	34.5	50.7
487			0.50	76.9	3.17	-	83.1	0.024	2.87	0.438	34.4	50.7
488			0.48	76.8	3.19	-	83.1	0.024	2.84	0.431	34.4	50.7
489			0.51	76.8	3.19	-	83.1	0.024	2.82	0.425	34.5	50.7
490	501.472	0.187	0.48	76.8	3.19	100	83.1	0.024	2.81	0.425	34.5	50.7
491			0.51	76.8	3.26	-	83.1	0.024	2.80	0.424	34.5	50.7
492			0.43	76.8	3.26	-	83.0	0.024	2.78	0.418	34.5	50.7
493			0.47	76.8	3.28	-	83.1	0.024	2.77	0.416	34.5	50.7
494			0.44	76.8	3.26	-	83.0	0.024	2.76	0.414	34.5	50.7
495			0.50	76.9	3.27	-	83.1	0.024	2.75	0.412	34.5	50.7
496			0.47	76.9	3.28	-	83.1	0.024	2.73	0.409	34.6	50.7
497			0.48	76.9	3.30	-	83.1	0.024	2.73	0.410	34.6	50.7
498			0.48	76.9	3.29	-	83.0	0.024	2.74	0.410	34.6	50.7
499			0.52	76.8	3.31	-	83.0	0.024	2.73	0.408	34.6	50.7
500	503.334	0.186	0.51	76.8	3.26	99	83.0	0.023	2.71	0.405	34.6	50.7
501			0.48	76.8	3.27	-	83.0	0.023	2.71	0.404	34.6	50.7
502			0.50	76.8	3.33	-	82.9	0.023	2.70	0.403	34.6	50.7
503			0.50	76.8	3.33	-	83.0	0.023	2.71	0.403	34.6	50.7
504			0.51	76.8	3.34	-	82.9	0.023	2.68	0.399	34.7	50.7
505			0.52	76.9	3.34	-	82.9	0.023	2.68	0.398	34.6	50.5
506			0.50	76.9	3.35	-	83.0	0.023	2.67	0.398	34.6	50.7



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
507			0.51	76.9	3.42	-	82.9	0.023	2.69	0.403	34.6	50.5
508	504.847	0.189	0.49	76.9	3.42	101	82.9	0.023	2.71	0.412	34.7	50.5
Avg/Tot	93.844	0.185	0.45	77.1	1.77	100	84.1	0.041	5.48	0.537	30.17	52.940

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 2

Technician: SJB

Date: 6/6/2023

Elapsed Time (min)	Particulate Sampling Data						
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	195.225		0.40	77.9	1.00		82.6
1			0.40	78.0	1.00	-	83.9
2			0.40	78.0	1.00	-	83.2
3			0.40	78.0	1.00	-	83.0
4			0.40	78.0	1.00	-	82.9
5			0.40	78.0	1.00	-	82.9
6			0.40	78.0	1.00	-	83.1
7			0.40	78.0	1.00	-	83.2
8			0.40	78.0	1.00	-	83.3
9			0.40	78.0	1.00	-	83.5
10	196.495	0.127	0.40	78.0	1.00	96	83.6
11			0.40	78.0	1.00	-	83.7
12			0.40	78.0	1.00	-	83.7
13			0.40	78.0	1.00	-	83.8
14			0.40	78.0	1.00	-	83.8
15			0.40	78.0	1.00	-	83.8
16			0.40	78.0	1.00	-	83.8
17			0.40	78.0	1.00	-	83.8
18			0.40	78.0	1.00	-	83.8
19			0.40	78.0	1.00	-	83.8
20	197.753	0.126	0.40	78.1	1.00	97	83.8
21			0.40	78.1	1.00	-	83.7
22			0.40	78.1	1.00	-	83.7
23			0.40	78.1	1.00	-	83.7
24			0.40	78.1	1.00	-	83.7
25			0.40	78.1	1.00	-	83.6
26			0.40	78.1	1.00	-	83.6
27			0.40	78.1	1.00	-	83.6
28			0.40	78.1	1.00	-	83.5
29			0.40	78.1	1.00	-	83.4
30	199.018	0.127	0.40	78.1	1.00	98	83.3
31			0.40	78.2	1.00	-	83.3

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 2

Technician: SJB

Date: 6/6/2023

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.40	78.2	1.00	-	83.2
33			0.40	78.2	1.00	-	83.2
34			0.40	78.2	1.00	-	83.2
35			0.40	78.2	1.00	-	83.2
36			0.40	78.2	1.00	-	83.1
37			0.40	78.2	1.00	-	82.9
38			0.40	78.2	1.00	-	83.0
39			0.40	78.3	1.00	-	82.9
40	200.278	0.126	0.40	78.3	1.00	105	82.8
41			0.40	78.3	1.00	-	82.8
42			0.40	78.3	1.00	-	82.8
43			0.40	78.3	1.00	-	82.7
44			0.40	78.3	1.00	-	82.7
45			0.40	78.3	1.00	-	82.7
46			0.40	78.3	1.00	-	82.6
47			0.40	78.3	1.00	-	82.5
48			0.40	78.2	1.00	-	82.5
49			0.40	78.2	1.00	-	82.4
50	201.545	0.127	0.40	78.3	1.00	101	82.3
51			0.40	78.3	1.00	-	82.3
52			0.40	78.3	1.00	-	82.3
53			0.40	78.3	1.00	-	82.2
54			0.40	78.3	1.00	-	82.2
55			0.40	78.3	1.00	-	82.1
56			0.40	78.3	1.00	-	82.1
57			0.40	78.3	1.00	-	82.1
58			0.40	78.4	1.00	-	82.1
59			0.40	78.4	1.00	-	82.0
60	202.817	0.127	0.40	78.4	1.00	97	82.0
Avg/Tot	7.592	0.127	0.40	78.2	1.00	99	83.1

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-161Model: 1.7RTracking #: 135Run #: 2Technician: SJBDate: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	685.8	394.6	555.3	433.4	431.7	500.2	N/A
1	647.5	401.4	559.8	437.4	431.8	495.6	N/A
2	624.7	406.2	560.2	439.5	432.5	492.6	N/A
3	636.3	410.3	555.8	441.2	433.5	495.4	N/A
4	664.5	414.0	547.0	442.7	433.7	500.4	N/A
5	689.0	417.1	536.0	442.7	432.8	503.5	N/A
6	709.3	419.3	524.7	442.2	432.2	505.5	N/A
7	724.5	420.9	514.3	441.7	431.7	506.6	N/A
8	730.4	421.7	505.0	439.7	429.4	505.2	N/A
9	735.3	422.0	496.4	436.4	427.4	503.5	N/A
10	736.3	422.0	488.6	433.2	425.6	501.1	N/A
11	738.9	422.0	481.0	430.9	423.5	499.3	N/A
12	738.1	420.9	474.4	427.7	421.5	496.5	N/A
13	739.6	418.7	468.7	424.2	419.2	494.1	N/A
14	739.5	416.1	463.5	420.9	416.7	491.3	N/A
15	733.9	413.4	458.3	417.8	413.9	487.5	N/A
16	723.6	411.2	453.6	414.7	410.9	482.8	N/A
17	710.3	408.6	448.6	411.4	408.0	477.4	N/A
18	696.8	406.5	443.6	408.0	405.4	472.1	N/A
19	683.5	404.0	438.5	405.0	402.5	466.7	N/A
20	669.6	401.4	433.4	402.7	399.7	461.4	N/A
21	657.2	399.0	428.3	399.7	396.6	456.2	N/A
22	646.1	396.8	423.4	397.1	393.5	451.4	N/A
23	636.1	394.2	418.3	394.2	390.7	446.7	N/A
24	628.1	391.9	413.5	391.5	387.9	442.6	N/A
25	621.2	390.0	408.8	388.6	384.7	438.7	N/A
26	615.8	387.2	404.4	386.3	381.6	435.0	N/A
27	612.0	385.4	400.1	383.8	378.7	432.0	N/A
28	609.3	383.0	395.9	381.6	375.7	429.1	N/A
29	609.0	380.7	392.0	379.1	373.0	426.7	N/A
30	610.6	378.8	388.1	375.9	370.5	424.8	N/A
31	611.5	376.3	384.5	373.5	367.3	422.6	N/A
32	613.0	373.6	381.2	371.1	364.3	420.7	N/A
33	616.8	371.1	377.9	368.9	361.6	419.3	N/A
34	619.6	368.5	374.8	366.7	358.9	417.7	N/A
35	622.9	366.4	372.0	364.7	356.5	416.5	N/A
36	626.3	363.7	369.4	362.8	354.1	415.2	N/A
37	628.4	361.2	367.0	361.2	351.8	413.9	N/A
38	631.0	359.1	365.0	359.0	350.0	412.8	N/A
39	631.9	357.1	363.1	357.6	348.2	411.6	N/A
40	633.7	354.8	361.3	356.0	346.5	410.4	N/A
41	634.4	352.4	359.7	354.5	344.8	409.2	N/A
42	634.6	350.2	358.4	352.9	343.4	407.9	N/A
43	635.3	348.0	357.2	351.3	341.9	406.8	N/A
44	635.2	346.2	356.1	350.1	340.5	405.6	N/A
45	636.0	344.0	355.0	349.0	339.2	404.6	N/A
46	636.2	341.8	353.9	348.0	338.2	403.6	N/A
47	638.6	339.6	352.9	346.9	337.1	403.0	N/A

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
48	640.7	337.4	352.0	345.9	336.2	402.4	N/A	
49	644.9	335.4	351.1	344.8	335.2	402.3	N/A	
50	649.9	333.3	350.4	343.9	334.4	402.4	N/A	
51	655.4	331.3	349.9	343.0	333.8	402.7	N/A	
52	661.1	329.4	349.4	342.1	333.1	403.0	N/A	
53	667.9	327.1	349.1	340.4	332.0	403.3	N/A	
54	674.1	324.5	348.8	339.2	331.0	403.5	N/A	
55	678.4	322.4	348.7	338.1	329.9	403.5	N/A	
56	681.2	320.8	348.8	337.0	329.6	403.5	N/A	
57	685.8	319.0	349.0	336.1	328.9	403.8	N/A	
58	688.2	317.3	349.4	334.9	328.7	403.7	N/A	
59	688.8	315.5	349.7	334.0	328.6	403.3	N/A	
60	686.9	313.7	350.0	333.1	328.6	402.4	N/A	
61	684.9	312.4	350.3	332.1	328.9	401.7	N/A	
62	682.9	310.6	350.5	331.3	328.9	400.8	N/A	
63	679.9	309.0	350.8	331.0	328.8	399.9	N/A	
64	676.7	306.9	351.1	330.6	328.7	398.8	N/A	
65	674.6	305.2	351.2	330.3	328.8	398.0	N/A	
66	671.6	304.2	351.4	329.6	328.7	397.1	N/A	
67	671.6	302.8	351.5	329.2	328.7	396.8	N/A	
68	670.7	301.2	351.7	328.8	328.7	396.2	N/A	
69	670.9	299.7	351.8	328.6	328.7	395.9	N/A	
70	671.2	298.7	351.9	328.0	328.8	395.7	N/A	
71	674.1	297.1	352.1	328.1	328.4	396.0	N/A	
72	675.1	295.7	352.2	328.0	328.2	395.8	N/A	
73	675.7	294.4	352.4	327.6	328.3	395.7	N/A	
74	677.2	293.1	352.7	327.4	327.9	395.7	N/A	
75	681.1	291.8	352.8	327.6	327.5	396.2	N/A	
76	685.4	290.4	353.1	327.8	326.9	396.7	N/A	
77	687.9	288.9	353.4	328.0	326.5	396.9	N/A	
78	692.4	287.9	353.6	328.2	326.6	397.7	N/A	
79	697.9	286.9	354.0	328.3	326.3	398.7	N/A	
80	703.7	286.1	354.5	328.5	326.5	399.9	N/A	
81	710.3	284.8	355.0	328.5	326.4	401.0	N/A	
82	713.3	283.7	355.5	329.2	326.4	401.6	N/A	
83	717.3	282.4	356.0	329.0	326.9	402.3	N/A	
84	721.8	281.4	356.5	329.6	327.2	403.3	N/A	
85	726.2	280.5	356.9	330.4	327.7	404.3	N/A	
86	730.4	279.2	357.4	330.6	328.0	405.1	N/A	
87	731.9	278.0	357.9	330.9	328.5	405.4	N/A	
88	732.4	277.4	358.2	331.7	329.3	405.8	N/A	
89	729.1	276.2	358.5	331.8	329.9	405.1	N/A	
90	721.7	275.4	358.9	332.3	330.5	403.8	N/A	
91	711.5	274.4	359.2	332.3	331.3	401.7	N/A	
92	700.1	273.5	359.1	332.3	331.9	399.4	N/A	
93	687.7	272.5	359.0	332.6	332.5	396.9	N/A	
94	674.8	272.1	358.6	333.2	333.4	394.4	N/A	
95	664.3	272.0	358.2	333.9	334.6	392.6	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-161Model: 1.7RTracking #: 135Run #: 2Technician: SJBDate: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
96	655.2	271.6	357.6	333.8	335.2	390.7	N/A	
97	646.8	271.6	356.9	333.8	335.8	389.0	N/A	
98	639.3	271.2	355.9	334.1	336.3	387.4	N/A	
99	634.7	270.4	354.9	334.6	336.7	386.2	N/A	
100	629.7	270.1	354.1	335.0	337.3	385.3	N/A	
101	625.8	269.9	353.3	335.6	337.5	384.4	N/A	
102	624.6	270.0	352.4	335.8	337.5	384.1	N/A	
103	626.3	270.0	351.9	335.8	337.2	384.3	N/A	
104	630.2	270.0	351.4	335.9	337.1	384.9	N/A	
105	633.0	270.1	351.2	336.1	336.9	385.4	N/A	
106	633.6	270.3	351.0	335.8	336.6	385.5	N/A	
107	631.4	270.6	350.9	335.4	336.3	384.9	N/A	
108	626.5	270.7	350.9	335.5	336.0	383.9	N/A	
109	620.6	270.6	351.1	335.5	335.8	382.7	N/A	
110	613.4	270.9	351.3	335.5	335.6	381.3	N/A	
111	606.0	270.9	351.4	335.4	335.6	379.9	N/A	
112	599.4	271.1	351.4	335.3	335.5	378.5	N/A	
113	592.6	271.1	351.4	335.3	335.0	377.1	N/A	
114	586.2	271.4	351.4	335.1	335.0	375.8	N/A	
115	580.2	271.7	351.4	335.0	334.9	374.6	N/A	
116	574.5	271.7	351.2	334.8	334.8	373.4	N/A	
117	569.7	272.0	351.0	334.2	334.5	372.3	N/A	
118	563.3	271.9	350.8	333.9	334.1	370.8	N/A	
119	558.4	272.1	350.3	333.6	334.1	369.7	N/A	
120	553.5	272.2	349.7	333.5	334.1	368.6	N/A	
121	548.7	272.2	349.1	333.2	333.8	367.4	N/A	
122	543.3	272.3	348.5	333.0	333.8	366.2	N/A	
123	539.7	272.3	348.0	332.6	333.8	365.3	N/A	
124	535.3	272.5	347.2	332.1	333.7	364.1	N/A	
125	529.2	272.5	346.5	331.5	333.6	362.7	N/A	
126	523.1	272.6	345.8	331.0	333.9	361.3	N/A	
127	514.3	272.6	345.2	331.1	334.6	359.6	N/A	
128	505.3	272.5	344.3	331.1	335.2	357.7	N/A	
129	496.3	273.0	343.4	331.1	335.7	355.9	N/A	
130	487.4	273.3	342.2	330.9	336.2	354.0	N/A	
131	479.3	273.9	340.7	330.7	336.5	352.2	N/A	
132	469.8	274.6	339.3	329.9	336.0	349.9	N/A	
133	461.9	274.7	337.8	328.4	335.0	347.6	N/A	
134	454.6	274.6	336.4	327.4	334.0	345.4	N/A	
135	447.9	274.7	335.1	326.4	333.3	343.5	N/A	
136	442.8	274.6	333.9	325.3	332.9	341.9	N/A	
137	438.1	274.5	333.0	324.4	332.3	340.4	N/A	
138	434.2	274.3	332.2	323.6	331.8	339.2	N/A	
139	429.5	274.3	331.6	323.0	331.1	337.9	N/A	
140	425.0	274.2	331.3	322.2	330.4	336.6	N/A	
141	421.3	274.0	331.2	321.4	329.9	335.6	N/A	
142	418.8	274.1	331.1	320.7	329.5	334.8	N/A	
143	416.6	274.2	331.1	320.3	329.9	334.4	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
144	413.9	274.1	331.4	319.8	330.4	333.9	N/A
145	411.5	274.3	332.0	319.5	330.6	333.6	N/A
146	408.4	274.9	332.5	319.2	331.1	333.2	N/A
147	404.0	275.2	333.1	318.5	330.5	332.3	N/A
148	401.8	275.3	333.6	317.6	329.8	331.6	N/A
149	399.2	275.5	334.2	316.7	329.0	330.9	N/A
150	397.4	275.5	334.7	316.0	328.6	330.5	N/A
151	396.3	275.8	335.2	315.7	329.3	330.5	N/A
152	394.1	275.7	335.9	315.4	329.6	330.1	N/A
153	391.5	276.3	336.7	314.7	329.2	329.7	N/A
154	389.8	276.4	337.2	314.1	328.6	329.2	N/A
155	388.0	276.5	337.8	313.5	327.9	328.7	N/A
156	387.4	276.7	338.1	313.0	328.1	328.6	N/A
157	385.6	276.8	338.5	312.2	328.0	328.2	N/A
158	384.3	276.9	338.8	311.8	327.8	327.9	N/A
159	382.5	277.2	339.3	311.4	327.3	327.5	N/A
160	381.7	277.3	339.5	310.8	326.6	327.2	N/A
161	380.6	277.6	339.7	310.3	326.2	326.9	N/A
162	380.2	277.6	340.1	309.9	326.2	326.8	N/A
163	378.3	277.8	340.7	309.2	326.0	326.4	N/A
164	376.6	278.1	341.0	308.8	325.4	326.0	N/A
165	375.4	278.3	341.0	308.4	324.6	325.5	N/A
166	374.3	278.4	341.0	307.9	324.2	325.2	N/A
167	373.2	278.6	341.2	307.5	323.7	324.8	N/A
168	372.5	278.6	341.5	307.1	323.1	324.6	N/A
169	371.7	278.9	341.7	306.6	322.7	324.3	N/A
170	371.4	279.0	342.0	306.2	322.3	324.2	N/A
171	370.4	279.3	342.2	305.8	321.9	323.9	N/A
172	370.0	279.3	342.5	305.4	322.3	323.9	N/A
173	369.3	279.4	342.9	305.0	322.4	323.8	N/A
174	368.3	279.4	343.1	304.7	322.4	323.6	N/A
175	367.0	279.5	343.5	304.5	322.3	323.4	N/A
176	366.3	280.0	343.7	304.1	322.4	323.3	N/A
177	365.4	280.0	344.0	304.0	322.4	323.2	N/A
178	364.6	280.3	344.2	303.7	322.2	323.0	N/A
179	363.7	280.4	344.4	303.4	322.0	322.8	N/A
180	362.9	280.5	344.5	303.3	321.9	322.6	N/A
181	362.2	280.6	344.6	303.0	321.7	322.4	N/A
182	361.6	280.8	344.7	302.6	321.1	322.2	N/A
183	361.0	280.9	344.7	302.5	320.7	322.0	N/A
184	359.3	281.2	344.6	302.0	320.0	321.4	N/A
185	357.4	281.6	344.4	300.8	319.6	320.8	N/A
186	355.5	281.4	343.8	299.8	318.9	319.9	N/A
187	354.2	281.3	343.1	299.0	318.5	319.2	N/A
188	352.4	281.0	342.5	298.3	317.7	318.4	N/A
189	351.1	280.9	341.8	297.5	317.0	317.7	N/A
190	349.7	280.8	341.1	296.9	316.4	317.0	N/A
191	348.1	280.7	340.5	296.4	316.0	316.3	N/A

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
192	346.6	280.5	339.9	295.7	315.5	315.6	N/A
193	345.4	280.3	339.3	294.8	314.9	314.9	N/A
194	344.2	280.3	338.8	293.8	314.1	314.2	N/A
195	343.1	280.2	338.2	293.2	313.7	313.7	N/A
196	341.9	279.7	337.6	292.8	313.0	313.0	N/A
197	340.8	279.5	337.1	292.3	312.4	312.4	N/A
198	339.3	279.2	336.4	291.8	311.8	311.7	N/A
199	338.3	278.9	335.7	291.4	311.0	311.1	N/A
200	337.0	278.5	335.1	290.8	310.2	310.3	N/A
201	336.0	278.2	334.6	290.2	309.7	309.8	N/A
202	335.0	278.2	334.2	289.5	309.4	309.3	N/A
203	333.7	277.9	333.8	289.1	308.9	308.7	N/A
204	332.9	277.6	333.3	288.6	308.1	308.1	N/A
205	331.9	277.2	332.9	288.1	307.5	307.5	N/A
206	331.0	276.9	332.4	287.4	307.0	307.0	N/A
207	330.1	276.6	332.0	286.6	306.4	306.3	N/A
208	329.4	276.2	331.6	286.1	305.6	305.8	N/A
209	328.2	275.7	331.2	285.6	305.2	305.2	N/A
210	327.0	275.3	330.8	285.1	304.5	304.5	N/A
211	326.5	275.0	330.3	284.6	304.1	304.1	N/A
212	325.2	274.7	329.8	284.2	303.6	303.5	N/A
213	324.2	274.3	329.4	283.5	303.1	302.9	N/A
214	323.2	273.7	328.9	283.0	302.4	302.2	N/A
215	322.8	273.3	328.4	282.4	301.9	301.8	N/A
216	321.5	273.0	328.0	281.8	301.3	301.1	N/A
217	320.8	272.6	327.5	281.1	300.8	300.6	N/A
218	319.8	272.3	327.1	280.6	300.3	300.0	N/A
219	318.8	271.9	326.7	280.2	299.8	299.5	N/A
220	317.7	271.4	326.2	279.7	299.3	298.9	N/A
221	316.8	271.1	325.8	279.5	298.9	298.4	N/A
222	315.9	270.6	325.4	279.0	298.2	297.8	N/A
223	314.7	270.1	325.0	278.6	297.9	297.3	N/A
224	313.9	269.7	324.6	278.4	297.6	296.9	N/A
225	313.1	269.2	324.3	278.0	297.0	296.3	N/A
226	312.3	268.8	323.8	277.3	296.7	295.8	N/A
227	312.0	268.3	323.4	277.0	296.1	295.4	N/A
228	310.9	268.0	323.0	276.7	295.7	294.9	N/A
229	310.1	267.5	322.7	276.5	295.3	294.4	N/A
230	309.5	267.0	322.3	276.3	294.9	294.0	N/A
231	308.6	266.5	321.8	276.0	294.4	293.5	N/A
232	308.0	265.9	321.4	276.2	294.1	293.1	N/A
233	307.4	265.4	321.0	275.8	293.5	292.6	N/A
234	306.6	265.1	320.5	275.2	293.2	292.1	N/A
235	305.6	264.5	320.0	275.1	292.9	291.6	N/A
236	305.0	264.0	319.6	275.0	292.4	291.2	N/A
237	304.3	263.4	319.2	275.1	292.0	290.8	N/A
238	303.7	263.0	318.8	275.1	291.5	290.4	N/A
239	302.9	262.6	318.2	274.8	291.2	289.9	N/A



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-161Model: 1.7RTracking #: 135Run #: 2Technician: SJBDate: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
240	302.7	262.2	317.7	274.8	290.8	289.6	N/A	
241	301.7	261.8	317.1	274.6	290.3	289.1	N/A	
242	301.0	261.3	316.6	274.7	289.9	288.7	N/A	
243	299.8	260.8	316.1	274.6	289.4	288.2	N/A	
244	299.0	260.4	315.6	274.4	288.9	287.7	N/A	
245	298.3	259.8	315.0	274.3	288.3	287.1	N/A	
246	297.4	259.5	314.3	274.0	287.9	286.6	N/A	
247	296.5	259.2	313.8	273.7	287.4	286.1	N/A	
248	295.7	258.7	313.1	273.6	286.9	285.6	N/A	
249	295.0	258.2	312.5	273.4	286.4	285.1	N/A	
250	294.2	257.8	311.8	273.0	285.8	284.5	N/A	
251	293.6	257.5	311.2	272.7	285.4	284.1	N/A	
252	292.8	257.1	310.5	272.4	284.7	283.5	N/A	
253	291.8	256.7	309.9	272.1	284.1	282.9	N/A	
254	291.0	256.2	309.4	271.9	283.8	282.4	N/A	
255	290.0	255.8	308.6	271.6	283.1	281.8	N/A	
256	289.2	255.3	307.9	271.3	282.6	281.3	N/A	
257	288.6	255.0	307.2	270.8	282.1	280.7	N/A	
258	287.4	254.6	306.3	270.2	281.6	280.0	N/A	
259	286.4	254.3	305.5	269.7	281.0	279.4	N/A	
260	285.8	253.8	304.7	269.0	280.5	278.8	N/A	
261	284.6	253.4	304.0	268.3	280.1	278.1	N/A	
262	283.8	253.0	303.1	267.6	279.6	277.4	N/A	
263	283.0	252.6	302.2	266.9	279.1	276.8	N/A	
264	282.0	252.1	301.2	266.1	278.6	276.0	N/A	
265	281.3	251.7	300.4	265.6	278.1	275.4	N/A	
266	280.4	251.3	299.5	264.7	277.7	274.7	N/A	
267	279.5	250.8	298.6	264.2	277.3	274.1	N/A	
268	278.7	250.4	297.6	263.4	276.8	273.4	N/A	
269	277.9	249.8	296.9	262.8	276.5	272.8	N/A	
270	277.0	249.5	296.1	261.8	276.0	272.1	N/A	
271	276.5	249.1	295.3	261.2	275.7	271.6	N/A	
272	275.8	248.6	294.6	260.7	275.2	271.0	N/A	
273	274.8	248.2	293.7	259.9	274.7	270.3	N/A	
274	274.2	247.8	293.0	259.0	274.4	269.7	N/A	
275	273.7	247.5	292.3	258.3	273.9	269.2	N/A	
276	272.8	246.9	291.6	257.6	273.5	268.5	N/A	
277	272.4	246.6	290.9	257.1	273.1	268.0	N/A	
278	272.0	246.3	290.2	256.4	272.7	267.5	N/A	
279	271.1	245.7	289.5	255.7	272.2	266.9	N/A	
280	270.6	245.3	289.0	255.2	271.8	266.4	N/A	
281	269.9	244.9	288.4	254.5	271.4	265.8	N/A	
282	269.3	244.5	288.0	254.0	270.9	265.3	N/A	
283	268.8	244.1	287.4	253.5	270.6	264.9	N/A	
284	268.2	243.7	286.9	252.8	270.1	264.3	N/A	
285	267.6	243.3	286.5	252.0	269.6	263.8	N/A	
286	267.2	242.9	286.0	251.7	269.1	263.4	N/A	
287	266.6	242.5	285.7	251.2	268.6	262.9	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-161Model: 1.7RTracking #: 135Run #: 2Technician: SJBDate: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
288	265.9	242.0	285.4	250.6	268.1	262.4	N/A
289	265.5	241.7	285.1	250.1	267.8	262.0	N/A
290	265.0	241.4	284.8	249.6	267.3	261.6	N/A
291	264.5	241.1	284.5	249.2	266.8	261.2	N/A
292	263.7	240.7	284.3	248.6	266.4	260.7	N/A
293	263.2	240.2	284.0	247.9	265.9	260.2	N/A
294	262.8	240.0	283.8	247.6	265.4	259.9	N/A
295	262.4	239.6	283.6	247.1	265.0	259.5	N/A
296	261.8	239.3	283.4	246.4	264.4	259.1	N/A
297	261.4	239.0	283.2	246.2	264.0	258.7	N/A
298	260.7	238.7	282.9	245.9	263.5	258.4	N/A
299	260.4	238.4	282.7	245.4	263.1	258.0	N/A
300	259.8	238.1	282.5	244.8	262.7	257.6	N/A
301	259.4	237.8	282.4	244.5	262.3	257.3	N/A
302	258.9	237.6	282.3	244.0	261.8	256.9	N/A
303	258.5	237.2	282.0	243.6	261.3	256.5	N/A
304	258.2	236.9	282.0	243.2	260.7	256.2	N/A
305	257.7	236.5	281.7	242.9	260.4	255.9	N/A
306	257.4	236.3	281.6	242.5	259.9	255.5	N/A
307	256.9	236.1	281.3	242.1	259.4	255.2	N/A
308	256.7	235.7	281.1	241.7	259.0	254.9	N/A
309	256.6	235.5	281.0	241.2	258.7	254.6	N/A
310	256.2	235.1	280.8	241.0	258.2	254.3	N/A
311	255.9	234.9	280.7	240.6	257.8	254.0	N/A
312	255.9	234.6	280.7	240.3	257.4	253.8	N/A
313	255.5	234.3	280.6	240.0	257.0	253.5	N/A
314	255.5	234.1	280.6	239.7	256.6	253.3	N/A
315	255.2	233.9	280.6	239.3	256.3	253.1	N/A
316	255.0	233.6	280.5	239.1	256.0	252.8	N/A
317	254.7	233.4	280.7	238.8	255.6	252.6	N/A
318	254.6	233.1	280.8	238.5	255.2	252.4	N/A
319	254.5	232.8	280.8	238.2	254.9	252.2	N/A
320	254.4	232.5	281.0	237.8	254.5	252.0	N/A
321	254.3	232.2	281.2	237.5	254.2	251.9	N/A
322	254.0	231.9	281.3	237.4	253.8	251.7	N/A
323	254.1	231.6	281.5	237.2	253.6	251.6	N/A
324	253.7	231.5	281.7	237.0	253.4	251.4	N/A
325	253.6	231.2	281.8	236.9	253.0	251.3	N/A
326	253.5	231.1	282.1	236.7	252.9	251.3	N/A
327	253.5	230.8	282.3	236.7	252.6	251.2	N/A
328	253.5	230.5	282.5	236.5	252.3	251.1	N/A
329	253.3	230.4	282.8	236.2	252.0	250.9	N/A
330	253.1	230.4	283.0	236.0	251.7	250.8	N/A
331	253.2	230.2	283.4	236.0	251.5	250.9	N/A
332	253.1	230.1	283.8	235.9	251.2	250.8	N/A
333	253.0	230.0	284.1	235.8	251.0	250.8	N/A
334	252.9	229.7	284.5	235.7	250.8	250.7	N/A
335	253.2	229.6	284.8	235.6	250.7	250.8	N/A

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
336	252.9	229.5	285.2	235.4	250.5	250.7	N/A	
337	252.7	229.3	285.4	235.6	250.3	250.7	N/A	
338	252.6	229.2	285.8	235.3	250.0	250.6	N/A	
339	252.5	229.0	286.2	235.1	249.9	250.5	N/A	
340	252.5	228.9	286.5	235.1	249.8	250.6	N/A	
341	252.6	228.8	286.8	235.1	249.6	250.6	N/A	
342	252.4	228.6	287.0	235.2	249.6	250.6	N/A	
343	252.4	228.5	287.4	235.2	249.3	250.5	N/A	
344	252.2	228.4	287.6	235.3	249.2	250.5	N/A	
345	252.3	228.4	287.9	235.1	249.0	250.6	N/A	
346	252.3	228.3	288.2	235.1	248.8	250.5	N/A	
347	252.2	228.2	288.5	235.0	248.6	250.5	N/A	
348	252.3	228.2	288.9	235.0	248.4	250.5	N/A	
349	252.3	228.2	289.2	235.0	248.0	250.6	N/A	
350	252.1	228.1	289.6	235.0	247.9	250.6	N/A	
351	252.3	227.9	289.9	234.8	247.7	250.5	N/A	
352	252.5	227.8	290.2	235.0	247.5	250.6	N/A	
353	252.6	227.7	290.7	235.0	247.3	250.7	N/A	
354	252.6	227.7	291.1	235.0	247.0	250.7	N/A	
355	252.8	227.5	291.3	234.9	246.9	250.7	N/A	
356	252.8	227.5	291.7	234.9	246.6	250.7	N/A	
357	252.5	227.5	291.9	235.0	246.4	250.7	N/A	
358	252.6	227.5	292.2	235.1	246.1	250.7	N/A	
359	252.8	227.4	292.5	235.1	245.9	250.7	N/A	
360	252.8	227.4	292.6	235.2	245.6	250.7	N/A	
361	252.9	227.4	292.8	235.3	245.4	250.8	N/A	
362	252.9	227.3	293.0	235.4	245.2	250.8	N/A	
363	252.9	227.4	293.1	235.3	244.8	250.7	N/A	
364	253.0	227.4	293.3	235.5	244.6	250.7	N/A	
365	252.8	227.4	293.4	235.8	244.1	250.7	N/A	
366	252.9	227.4	293.5	235.7	243.7	250.6	N/A	
367	252.8	227.4	293.5	235.9	243.4	250.6	N/A	
368	252.4	227.4	293.6	236.2	243.2	250.5	N/A	
369	252.5	227.4	293.6	236.3	242.9	250.5	N/A	
370	252.4	227.4	293.6	236.4	242.5	250.5	N/A	
371	252.2	227.3	293.7	236.5	242.1	250.4	N/A	
372	252.0	227.3	293.7	236.7	241.8	250.3	N/A	
373	251.9	227.3	293.7	236.8	241.5	250.3	N/A	
374	251.7	227.2	293.7	236.9	241.1	250.2	N/A	
375	251.6	227.2	293.8	237.2	240.7	250.1	N/A	
376	251.6	227.3	293.8	237.3	240.4	250.1	N/A	
377	251.5	227.4	293.9	237.4	240.0	250.0	N/A	
378	251.5	227.4	294.0	237.7	239.7	250.0	N/A	
379	251.1	227.3	294.0	237.9	239.3	249.9	N/A	
380	251.1	227.3	294.2	238.0	239.0	249.9	N/A	
381	251.1	227.3	294.3	238.4	238.7	250.0	N/A	
382	250.9	227.5	294.4	238.6	238.3	249.9	N/A	
383	250.7	227.4	294.6	238.7	237.9	249.9	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
384	250.9	227.4	294.7	238.8	237.6	249.9	N/A	
385	250.8	227.5	294.8	239.0	237.3	249.9	N/A	
386	250.7	227.5	295.0	239.1	237.0	249.9	N/A	
387	250.4	227.6	295.2	239.2	236.6	249.8	N/A	
388	250.4	227.6	295.3	239.3	236.3	249.8	N/A	
389	250.5	227.5	295.5	239.6	236.0	249.8	N/A	
390	250.4	227.4	295.7	239.7	235.5	249.8	N/A	
391	250.3	227.5	295.9	239.8	235.3	249.8	N/A	
392	250.4	227.7	296.2	240.1	234.8	249.8	N/A	
393	250.3	227.6	296.4	240.3	234.6	249.9	N/A	
394	250.1	227.4	296.9	240.4	234.3	249.8	N/A	
395	250.3	227.5	297.5	240.4	234.0	249.9	N/A	
396	250.3	227.5	298.1	240.6	233.7	250.1	N/A	
397	250.1	227.6	298.5	240.5	233.5	250.1	N/A	
398	250.0	227.6	298.9	240.8	233.2	250.1	N/A	
399	250.0	227.6	299.1	240.9	232.9	250.1	N/A	
400	249.8	227.7	299.4	241.0	232.7	250.1	N/A	
401	249.7	227.7	299.7	241.1	232.4	250.1	N/A	
402	249.5	227.6	299.8	241.1	232.2	250.0	N/A	
403	249.1	227.7	300.0	240.9	231.9	249.9	N/A	
404	248.7	227.7	300.1	241.0	231.7	249.8	N/A	
405	248.4	227.7	300.2	240.7	231.6	249.7	N/A	
406	248.1	227.8	300.2	240.6	231.5	249.6	N/A	
407	247.7	227.7	300.1	240.6	231.1	249.5	N/A	
408	247.5	227.8	300.1	240.4	230.9	249.3	N/A	
409	247.1	227.7	300.0	240.1	230.7	249.1	N/A	
410	247.1	227.7	299.9	240.2	230.5	249.1	N/A	
411	246.7	227.8	299.8	240.1	230.3	248.9	N/A	
412	246.3	227.6	299.6	239.8	230.2	248.7	N/A	
413	246.2	227.6	299.5	239.7	229.9	248.6	N/A	
414	245.9	227.6	299.4	239.4	229.8	248.4	N/A	
415	245.6	227.6	299.1	239.3	229.6	248.2	N/A	
416	245.2	227.5	299.0	239.1	229.3	248.0	N/A	
417	245.0	227.5	298.8	239.0	229.2	247.9	N/A	
418	244.8	227.4	298.7	238.7	229.0	247.7	N/A	
419	244.9	227.4	298.7	238.5	228.8	247.7	N/A	
420	244.6	227.3	298.8	238.5	228.6	247.6	N/A	
421	244.4	227.2	299.0	238.0	228.4	247.4	N/A	
422	244.2	227.1	299.1	237.9	228.2	247.3	N/A	
423	244.2	227.2	299.4	237.6	228.0	247.3	N/A	
424	243.8	227.0	299.5	237.5	227.8	247.1	N/A	
425	243.6	227.0	299.7	237.3	227.6	247.0	N/A	
426	243.5	227.0	299.8	237.0	227.3	246.9	N/A	
427	243.3	226.9	300.0	236.9	227.2	246.9	N/A	
428	243.2	226.8	300.1	236.6	227.0	246.7	N/A	
429	243.0	226.8	300.2	236.5	226.8	246.7	N/A	
430	242.9	226.7	300.3	236.3	226.6	246.6	N/A	
431	242.8	226.6	300.4	236.1	226.4	246.4	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-161Model: 1.7RTracking #: 135Run #: 2Technician: SJBDate: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
432	242.5	226.6	300.6	235.9	226.2	246.3	N/A	
433	242.3	226.5	300.7	235.6	225.9	246.2	N/A	
434	242.0	226.5	300.7	235.4	225.8	246.1	N/A	
435	241.7	226.4	300.8	235.2	225.6	245.9	N/A	
436	241.6	226.4	300.8	234.9	225.4	245.8	N/A	
437	241.2	226.4	300.9	234.7	225.1	245.7	N/A	
438	241.1	226.4	300.9	234.5	224.9	245.5	N/A	
439	240.9	226.3	300.9	234.3	224.7	245.4	N/A	
440	240.7	226.2	301.0	234.1	224.5	245.3	N/A	
441	240.5	226.1	301.3	233.9	224.3	245.2	N/A	
442	240.3	226.1	301.7	233.7	224.0	245.2	N/A	
443	240.0	225.9	301.9	233.5	223.8	245.0	N/A	
444	239.5	226.0	301.9	233.3	223.5	244.8	N/A	
445	239.2	225.9	301.8	233.2	223.3	244.7	N/A	
446	239.0	225.9	301.6	232.9	223.2	244.5	N/A	
447	238.6	225.9	301.3	232.9	223.0	244.3	N/A	
448	238.4	225.9	300.9	232.7	222.7	244.1	N/A	
449	238.3	225.9	300.5	232.6	222.6	244.0	N/A	
450	237.8	225.8	300.0	232.6	222.5	243.7	N/A	
451	237.7	225.7	299.6	232.4	222.3	243.5	N/A	
452	237.3	225.7	299.1	232.4	222.1	243.3	N/A	
453	237.1	225.6	298.7	232.5	221.8	243.1	N/A	
454	236.8	225.5	298.1	232.3	221.6	242.9	N/A	
455	236.6	225.5	297.4	232.3	221.5	242.7	N/A	
456	236.2	225.4	296.9	232.1	221.1	242.4	N/A	
457	236.0	225.4	296.2	232.0	220.9	242.1	N/A	
458	235.7	225.2	295.5	231.9	220.7	241.8	N/A	
459	235.5	225.1	294.8	231.9	220.4	241.5	N/A	
460	235.4	224.9	294.1	232.0	220.2	241.3	N/A	
461	235.3	224.9	293.6	231.8	220.0	241.1	N/A	
462	234.9	224.8	292.9	231.9	219.8	240.9	N/A	
463	234.8	224.6	292.3	231.9	219.5	240.6	N/A	
464	234.5	224.6	291.6	231.8	219.3	240.4	N/A	
465	234.4	224.4	291.0	231.8	219.1	240.1	N/A	
466	234.0	224.3	290.3	231.7	218.8	239.8	N/A	
467	233.8	224.2	289.7	231.5	218.6	239.6	N/A	
468	233.5	224.1	289.0	231.4	218.4	239.3	N/A	
469	233.1	224.0	288.3	231.2	218.1	238.9	N/A	
470	233.0	223.9	287.5	231.2	217.9	238.7	N/A	
471	232.7	223.7	286.5	231.1	217.6	238.3	N/A	
472	232.3	223.6	285.3	231.0	217.3	237.9	N/A	
473	232.2	223.4	284.2	230.8	217.0	237.5	N/A	
474	232.0	223.3	283.0	230.6	216.8	237.1	N/A	
475	231.8	223.1	281.7	230.4	216.7	236.7	N/A	
476	231.9	223.0	280.6	230.4	216.3	236.4	N/A	
477	231.5	222.8	279.4	230.0	216.0	235.9	N/A	
478	231.5	222.6	278.3	229.7	215.8	235.5	N/A	
479	231.1	222.3	277.2	229.6	215.5	235.2	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
480	230.9	222.1	276.1	229.1	215.3	234.7	N/A	
481	230.9	221.9	275.1	229.0	215.1	234.4	N/A	
482	230.6	221.7	274.1	228.6	214.9	234.0	N/A	
483	230.7	221.6	273.2	228.2	214.6	233.7	N/A	
484	230.3	221.4	272.3	227.8	214.3	233.2	N/A	
485	230.0	221.2	271.5	227.2	214.1	232.8	N/A	
486	229.7	221.0	270.6	226.8	213.8	232.4	N/A	
487	229.5	220.8	269.8	226.4	213.6	232.0	N/A	
488	229.1	220.5	268.9	226.1	213.2	231.6	N/A	
489	228.9	220.3	268.0	225.5	212.9	231.1	N/A	
490	228.5	220.1	267.1	225.2	212.7	230.7	N/A	
491	228.1	219.9	266.3	224.6	212.4	230.3	N/A	
492	227.7	219.7	265.5	224.2	212.0	229.8	N/A	
493	227.3	219.5	264.7	223.7	211.7	229.4	N/A	
494	227.0	219.2	263.8	223.2	211.5	228.9	N/A	
495	226.5	219.0	262.9	222.7	211.2	228.5	N/A	
496	225.9	218.7	262.2	222.3	210.9	228.0	N/A	
497	225.4	218.4	261.4	221.8	210.5	227.5	N/A	
498	224.9	218.1	260.6	221.2	210.3	227.0	N/A	
499	224.6	217.9	259.8	220.6	209.9	226.6	N/A	
500	224.2	217.7	259.1	220.2	209.6	226.2	N/A	
501	223.8	217.4	258.4	219.5	209.2	225.7	N/A	
502	223.2	217.2	257.6	219.0	208.9	225.2	N/A	
503	222.8	216.9	257.0	218.4	208.6	224.7	N/A	
504	222.3	216.6	256.3	218.0	208.2	224.3	N/A	
505	222.0	216.3	255.6	217.2	207.9	223.8	N/A	
506	221.6	216.1	254.9	216.8	207.7	223.4	N/A	
507	221.2	215.8	254.3	216.1	207.3	222.9	N/A	
508	220.7	215.6	253.7	215.6	206.9	222.5	N/A	
Average	377.8	265.0	323.2	282.8	286.9	307	N/A	

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/6/2023

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0137	188.1	195.7	7.6
	<b>B</b>	H0138	187.1	194.6	7.5
	<b>C - 1st Hour</b>	H0139	187.5	190.0	2.5
	<b>Amb</b>	H0153	95.3	95.4	0.1
<b>Probes</b>	<b>A</b>	5A	116757.0	116757.1	0.1
	<b>B</b>	5B	116875.4	116875.5	0.1
	<b>C - 1st Hour</b>	5C	115855.0	115855.2	0.2
<b>O-rings</b>	<b>A</b>	5A	3535.4	3536.0	0.6
	<b>B</b>	5B	3531.4	3532.1	0.7
	<b>C - 1st Hour</b>	5C	3375.4	3376.2	0.8

**Placed in Desiccator on:** 6/12 - 10:30

**Balance Audit (mg):** 100.0 100.0 100.0

*Undesiccated                      Dessicated                      Dessicated                      Desiccated*

<b>Filters</b>	<b>A</b>	196.0	6/6 20:59	195.8	6/14 10:42	195.7	6/15 12:30		
	<b>B</b>	194.9	6/6 20:59	194.6	6/14 10:43	194.6	6/15 12:30		
	<b>C - 1st Hour</b>	190.0	6/6 13:10	190.0	6/14 10:43	190.0	6/15 12:30		
	<b>Amb</b>	95.5	6/6 20:59	95.5	6/14 10:43	95.4	6/15 12:30		
<b>Probes</b>	<b>A</b>			116757.2	6/14 10:53	116757.1	6/15 12:41		
	<b>B</b>			116875.5	6/14 10:53	116875.5	6/15 12:42		
	<b>C - 1st Hour</b>			115855.1	6/14 10:54	115855.2	6/15 12:42		
<b>O-Rings</b>	<b>A</b>			3536.2	6/14 10:33	3536.0	6/15 12:20		
	<b>B</b>			3532.2	6/14 10:33	3532.1	6/15 12:20		
	<b>C - 1st Hour</b>			3376.1	6/14 10:33	3376.2	6/15 12:21		

<b>Train A Aggregate, mg:</b>	<b>8.3</b>
<b>Train B Aggregate, mg:</b>	<b>8.3</b>
<b>Train C Aggregate, mg:</b>	<b>3.5</b>
<b>Ambient Aggregate, mg:</b>	<b>0.1</b>

## ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
 Model: 1.7R Run Number: 3&4 Test Date: 6/7/2023

### Wood Heater Run Notes

**High Fire Test Notes**

Test Burn Start Time: 9:40  
 Air Control Setting: Fully Open

Time	Notes
9:40	Light newspaper on top of kindling with torch (10 seconds) left door open
9:43	Door closed, fan off, air set to high (fully open)
10:18	@ 2.05 lbs, leveled coal bed and loaded high fire test load, door left open
10:23	Closed door, fan turned on to max speed
10:45	Unable to maintain sample rates for both sample trains, had to change filters out for both trains, Prior to changing, leak test was done, both trains had a leakage rate 0.001 cfm at a vacuum of 10 inHg. Train A Volume Prior to Leak Check: 441.714, After Leak Check: 441.750, Net: 0.036 ft <sup>3</sup> Train B Volume Prior to Leak Check: 517.208, After Leak Check: 517.233, Net: 0.025 ft <sup>3</sup>
11:45	Ended test at 3.59 lbs (2.05 lbs coal bed + 1.54 lbs of high fire load) remaining

Test Burn End Time: 11:45

**Low/Medium Fire Test Notes**

Test Burn Start Time: 11:53  
 Air Control Setting: Medium Setting - 5/16" from fully closed

Time	Notes
11:53	Loaded medium fire test load, door left open
11:57	Closed door
11:59	Closed air down to 1/2" from fully open
12:02	Closed air down to 3/8" from fully open
12:05	Closed air down to test medium setting, 5/16" from fully open, turned fan on to maximum speed
17:37	End of Test

Test Burn End Time: 17:37

### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 18.00 CO (%): 4.35  
 Mid Gas CO<sub>2</sub> (%): 10.10 CO (%): 1.98

**Calibration Results:**

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:51	9:00	8:55	8:22	8:20	8:23
CO <sub>2</sub>	0.00	10.05	18.01	-0.03	10.05	18.16
CO	0.000	1.962	4.351	-0.006	1.934	4.368

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

Technician Signature: 

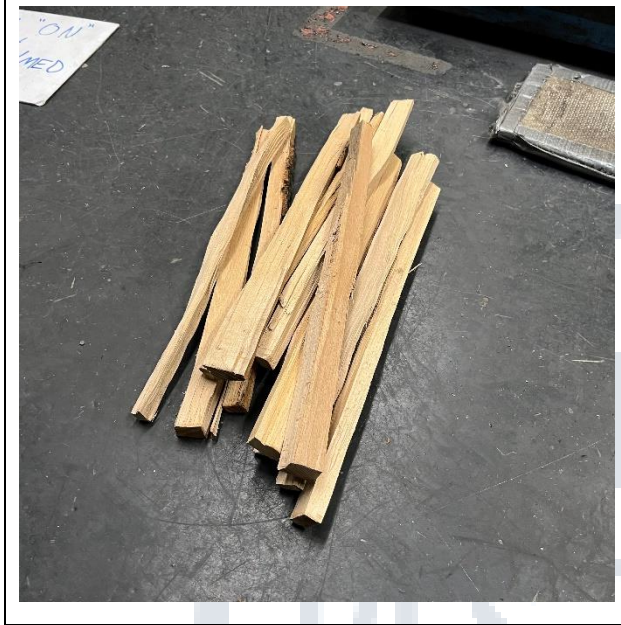
Date: 7/5/2023



# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 3&4 Test Date: 6/7/2023

## Test Photos



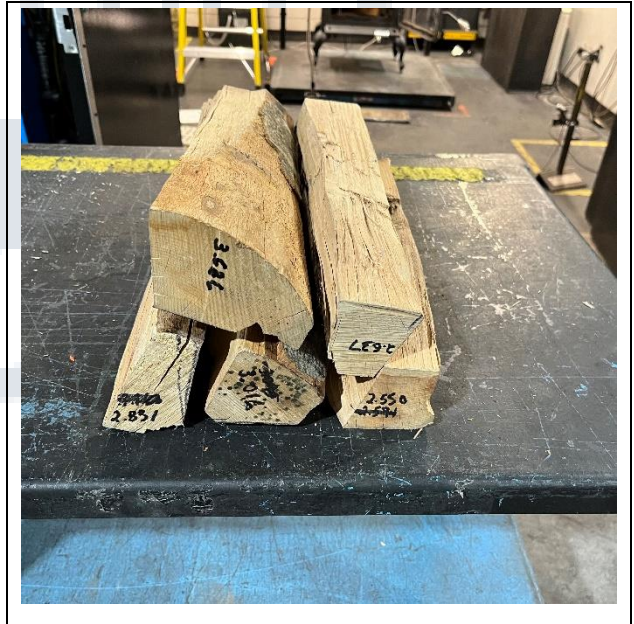
Kindling Fuel Load



Start-up Fuel Load



Kindling & Start-up Loaded in Stove



High Fire Fuel Load

Technician Signature: *Sebastian E. Collins*

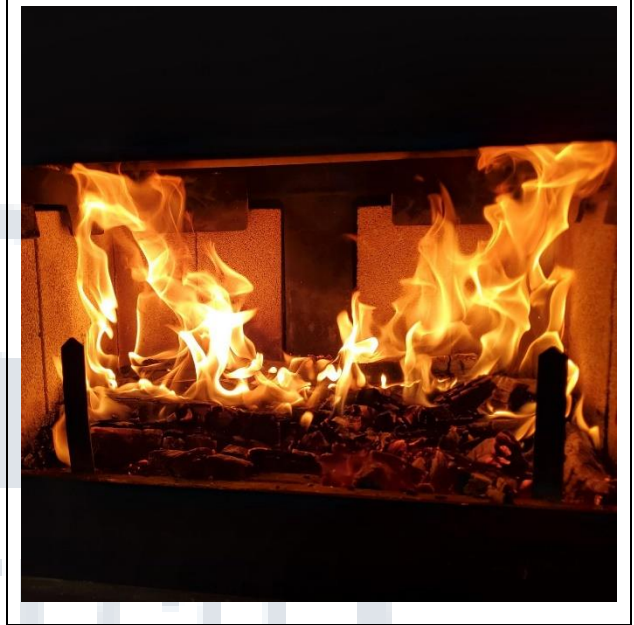
Date: 7/5/2023

# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 3&4 Test Date: 6/7/2023



Residual Start-up Fuel Coal Bed – Pre Rake



Residual Start-up Fuel Coal Bed – Post Rake



High Fire Fuel Loaded



Air Setting – High Fire

Technician Signature: *Sebastian E. Sutton*

Date: 7/5/2023

# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 3&4 Test Date: 6/7/2023



Residual High Fire Load Coal Bed – Pre Rake



Residual High Fire Load Coal Bed – Post Rake



Medium Fire Fuel Load



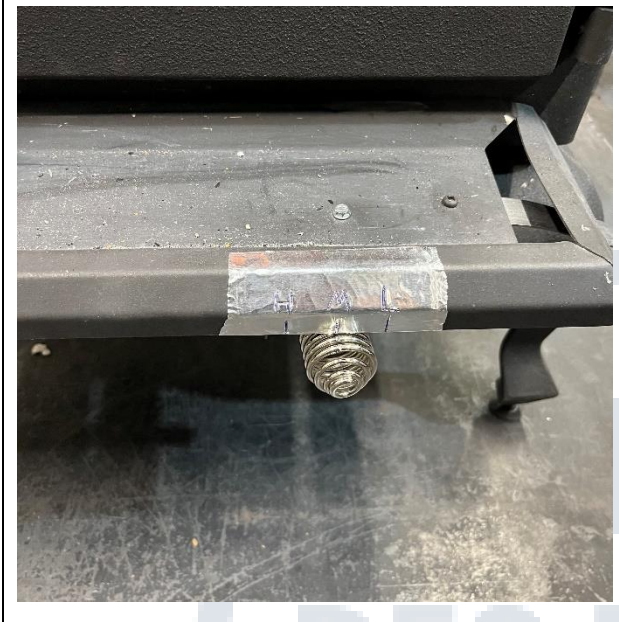
Medium Fire Fuel Loaded

Technician Signature: *Sebastian E. Sutton*

Date: 7/5/2023

# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 3&4 Test Date: 6/7/2023



**Medium Fire Air Setting**



Technician Signature: *Sebastian E. Collins*

Date: 7/5/2023

**WOOD STOVE TEST DATA PACKET**  
**ASTM E3053/E2515**



**Run 3 Data Summary**

Client: SBI  
Model: 1.7R  
Job #: 23-161  
Tracking #: 135  
Test Date: 6/7/2023

A handwritten signature in dark ink, appearing to read "Sebastian E. ...", is written over a horizontal line.

Techician Signature

7/5/2023

Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI

Model: 1.7R

Run #: 3

Job #: 23-161

Tracking #: 135

Technician: SJB

Date: 6/7/2023

<b>Burn Rate (kg/hr):</b>	<b>3.29</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	23.128	22.124	21.568	7.549
Average Gas Velocity in Dilution Tunnel (ft/sec)	24.83			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	28189.4			
Average Gas Meter Temperature (°F)	81.9	76.9	75.5	75.5
Total Sample Volume (dscf)	22.293	21.854	21.239	7.291
Average Tunnel Temperature (°F)	100.9			
Total Time of Test (min)	125			
Total Particulate Catch (mg)	0.0	5.2	5.8	3.3
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0002379	0.0002731	0.0004526
Total PM Emissions (g)	0.00	13.97	16.04	12.76
Particulate Emission Rate (g/hr)	0.00	6.71	7.70	12.76
Emissions Factor (g/kg)	-	2.13	2.44	-
Difference from Average Total Particulate Emissions (g)	-	1.03	1.03	-
Difference from Average Total Particulate Emissions (%)	-	6.9%	6.9%	-
Difference from Average Emissions Factor (g/kg)	-	0.16	0.16	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	15.01
Particulate Emission Rate (g/hr)	7.20
Emissions Factor (g/kg)	2.28
HHV Efficiency (%)	66.3%
LHV Efficiency (%)	71.0%
CO Emissions (g/min)	1.12

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 81.6/Max: 88.1	OK
Face Velocity	< 30 ft/min	9.9	OK
Leakage Rate	Less than 4% of average sample rate	0.003 cfm	OK
Ambient Temp	55-90 °F	Min:75.5/Max:89	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 06/07/23  
**Run:** 3  
**Control #:** 23-161  
**Test Duration:** 86  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	66.3%	71.0%
<b>Combustion Efficiency</b>	99.0%	99.0%
<b>Heat Transfer Efficiency</b>	67.0%	71.7%

<b>Output Rate (kJ/h)</b>	41,852	39,701	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	3.36	7.40	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	63,154	59,908	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	4.81	10.61	<b>dry lb</b>
<b>MC wet (%)</b>	17.31		
<b>MC dry (%)</b>	20.93		
<b>Particulate (g )</b>	15.01		
<b>CO (g)</b>	96		
<b>Test Duration (h)</b>	1.43		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.25	1.60
<b>g/kg Dry Fuel</b>	3.12	19.94
<b>g/h</b>	10.47	66.98
<b>g/min</b>	0.17	1.12
<b>lb/MM Btu Output</b>	0.58	3.72

<b>Air/Fuel Ratio (A/F)</b>	13.91
-----------------------------	-------

VERSION:

2.4

4/15/2010

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking # 135  
 Technician: SJB  
 Date: 6/7/2023

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.89  
 Max Allowable Start-up Fuel Weight (lbs): 4.33

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.25	2.83	In Range	17.5	24.6	19.5	20.5	In Range	2.35	1.06
2	15.75	3.01	In Range	17.9	27.2	22.0	22.4	In Range	2.46	1.12
3	15.75	2.55	In Range	23.8	25.5	16.8	22.0	In Range	2.09	0.95
Core Load Wt. (lbs)		8.39	In Range							

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	2.37	In Range	19.4	24.4	20.2	21.3	In Range	1.95	0.89
2	16.00	3.67	In Range	19.1	18.7	19.5	19.1	In Range	3.08	1.40
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.04	In Range							

Total Load Weight (lbs): 14.43 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: 100% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.0  
 Total Load Average Moisture Content (%DB): 20.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.3  
 Total Test Load Weight (dry basis): 11.93 lbs 5.41 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.86	In Range	10	10	10	10.0	In Range	2.60	1.18

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.29	In Range	20.3	21.7	20.5	20.8	In Range	3.55	1.61

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.4 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 2.05 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.3 to 1.59 lb  
 Actual Fuel Load Ending Weight (lb): 1.54 In Range

Total Weight All Fuel Added: 21.58 lbs, wet basis      Total Weight All Fuel Burned (dry basis): 14.50 lbs  
 18.09 lbs, dry basis      6.57 kg  
 8.20 kg, dry basis



## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3  
 Test Start Time: 9:40  
 Test Type: High Fire

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Recording Interval (min): 1  
 Total Sampling Time (min): 125  
 High Fire Test Load Time (min): 39

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0.0005  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 6/5/2023  
 Test Fuel Scale Audit (kg): 5.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.30	29.34	29.32
Relative Humidity (%)	34.8	37.7	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Platform Scale Audit (kg)	5.0	5.0	

Ambient Sample Volume: 23.128 ft<sup>3</sup>

### Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.000	0.001	cfm @	-5 in. Hg
(B)	0.000	0.001	cfm @	-5 in. Hg
(C)	0.002	0.003	cfm @	-5 in. Hg
(Ambient)	0.000	0.000	cfm @	-5 in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.124	76
2	0.146	76
3	0.146	76
4	0.134	76
5	0.104	76
6	0.142	76
7	0.147	76
8	0.134	76
Center	0.152	76

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 24.73 ft/sec  
 V<sub>scent</sub>: 26.32 ft/sec  
 F<sub>p</sub>: 0.940 [ratio]

Initial Tunnel Flow: 489.5 scf/min

Static Pressure: -0.314 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI \_\_\_\_\_  
Model: 1.7R \_\_\_\_\_  
Run #: 3 \_\_\_\_\_

Job #: 23-161 \_\_\_\_\_  
Tracking #: 135 \_\_\_\_\_  
Technician: SJB \_\_\_\_\_  
Date: 6/7/2023 \_\_\_\_\_

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

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	429.728		0.151	1.09	76.3	0.00		7.24		75.6	77.4	82.4	75.5
1			0.151	1.13	76.9	0.69	-	7.16	-0.08	79.4	118.5	82.2	75.6
2			0.150	1.15	76.9	0.71	-	7.09	-0.07	81.0	141.4	82.0	75.7
3			0.150	1.12	76.9	0.72	-	6.99	-0.11	83.9	169.6	82.0	75.9
4			0.151	1.15	76.9	0.75	-	6.83	-0.16	81.2	236.9	81.8	76.1
5			0.149	1.16	76.9	0.76	-	6.67	-0.16	82.2	309.0	81.6	76.2
6			0.148	1.17	76.9	0.78	-	6.51	-0.16	84.5	377.9	82.4	76.2
7			0.149	1.15	76.9	0.80	-	6.32	-0.19	86.7	433.4	83.6	76.3
8			0.148	1.17	76.9	0.82	-	6.12	-0.20	88.6	472.5	84.3	76.4
9			0.149	1.18	76.9	0.84	-	5.93	-0.19	90.2	497.1	84.3	76.6
10	431.536	0.181	0.148	1.19	76.9	0.85	100	5.73	-0.20	91.5	515.8	84.2	76.8
11			0.148	1.17	76.9	0.83	-	5.55	-0.18	92.6	527.4	84.0	77.0
12			0.148	1.20	76.9	0.89	-	5.41	-0.14	92.2	514.0	84.0	77.1
13			0.148	1.12	76.9	0.89	-	5.27	-0.14	92.2	502.7	83.8	77.3
14			0.148	1.19	76.9	0.90	-	5.14	-0.13	92.2	491.8	83.8	77.5
15			0.147	1.16	76.9	0.88	-	4.99	-0.14	92.1	484.9	83.7	77.7
16			0.147	1.12	76.9	0.88	-	4.87	-0.12	92.0	476.2	83.5	77.9
17			0.148	1.14	76.9	0.87	-	4.77	-0.10	91.8	464.3	83.4	78.0
18			0.147	1.09	76.9	0.88	-	4.64	-0.13	92.7	473.4	83.5	78.1
19			0.146	1.14	76.9	0.90	-	4.49	-0.15	93.1	482.7	83.5	78.2
20	433.330	0.179	0.147	1.12	76.9	0.89	100	4.37	-0.12	93.2	473.8	83.6	78.3
21			0.147	1.09	76.9	0.89	-	4.26	-0.11	92.0	467.5	83.5	78.7
22			0.149	1.09	76.8	0.90	-	4.14	-0.12	90.8	459.5	83.2	78.9
23			0.148	1.00	76.8	0.92	-	4.02	-0.11	90.8	455.0	83.2	79.3
24			0.147	1.03	76.9	0.91	-	3.89	-0.14	91.5	466.6	83.2	79.8
25			0.147	1.09	76.9	0.91	-	3.73	-0.15	92.2	479.8	83.2	80.1
26			0.147	1.06	76.9	0.91	-	3.57	-0.16	92.8	493.4	83.1	80.3
27			0.147	0.97	76.9	0.91	-	3.41	-0.17	93.5	505.4	83.2	81.0
28			0.146	1.03	76.9	0.91	-	3.25	-0.16	94.5	519.1	83.2	81.1
29			0.146	1.11	76.9	0.91	-	3.08	-0.16	94.9	524.0	83.3	81.5
30	435.138	0.181	0.148	0.99	77.0	0.92	101	2.95	-0.13	95.0	520.3	83.3	81.9
31			0.148	1.00	77.0	0.92	-	2.81	-0.14	94.9	515.9	83.4	82.1
32			0.146	0.91	77.0	0.91	-	2.68	-0.13	94.9	510.8	83.3	82.5

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.146	0.96	77.0	0.92	-	2.55	-0.13	95.1	508.3	83.4	82.7
34			0.147	0.94	77.0	0.91	-	2.44	-0.11	95.2	508.8	83.4	82.9
35			0.146	0.93	77.0	0.91	-	2.31	-0.13	95.3	507.7	83.4	83.3
36			0.148	0.88	77.0	0.92	-	2.21	-0.10	95.1	499.9	83.3	83.4
37			0.145	0.87	77.0	0.92	-	2.10	-0.11	98.0	494.2	83.5	82.4
38			0.146	0.87	77.0	0.93	-	2.03	-0.06	98.1	488.8	83.7	81.2
39			0.141	0.84	77.1	0.95	-	16.42	14.39	120.9	456.8	85.4	80.9
40	436.940	0.180	0.144	0.86	77.1	1.01	103	16.33	-0.10	116.1	405.3	85.5	82.5
41			0.144	0.67	77.0	1.11	-	16.22	-0.11	113.7	398.1	85.2	83.5
42			0.143	0.73	76.9	1.24	-	16.14	-0.07	111.5	375.7	84.7	83.9
43			0.143	0.73	76.9	2.10	-	16.03	-0.11	108.6	357.7	84.5	84.2
44			0.148	0.68	77.0	2.34	-	15.95	-0.08	95.8	361.6	83.4	84.3
45			0.148	0.70	77.0	2.68	-	15.86	-0.08	92.8	357.9	82.9	84.6
46			0.149	0.69	77.0	3.57	-	15.79	-0.07	91.2	356.1	82.5	84.5
47			0.150	0.73	76.9	3.78	-	15.73	-0.06	90.5	353.0	82.4	84.6
48			0.149	0.72	76.9	3.97	-	15.65	-0.09	90.3	353.1	82.2	84.4
49			0.149	0.72	76.9	4.09	-	15.57	-0.08	90.4	358.9	82.1	84.3
50	438.666	0.173	0.149	0.73	76.9	4.20	98	15.48	-0.09	90.7	368.5	82.2	84.6
51			0.149	0.69	76.9	4.64	-	15.38	-0.10	91.2	381.6	82.2	84.4
52			0.148	0.71	76.9	4.17	-	15.34	-0.04	92.8	397.8	82.1	84.6
53			0.148	0.72	76.8	4.48	-	15.19	-0.15	93.7	434.5	82.1	84.8
54			0.147	0.74	76.8	4.88	-	15.03	-0.16	95.6	465.8	82.6	85.3
55			0.147	0.76	76.9	5.57	-	14.87	-0.16	96.2	490.8	83.4	85.3
56			0.147	0.76	76.9	6.31	-	14.70	-0.17	97.4	515.3	83.5	86.0
57			0.147	0.74	76.9	8.67	-	14.49	-0.21	99.5	537.1	83.2	85.8
58			0.146	0.75	76.9	6.83	-	14.29	-0.20	102.4	545.8	83.4	84.3
59			0.146	0.77	76.9	7.69	-	14.12	-0.17	104.4	555.0	83.2	82.8
60	440.478	0.181	0.145	0.75	76.9	7.59	102	13.99	-0.14	104.6	553.9	83.3	82.3
61			0.147	0.77	76.9	7.79	-	13.82	-0.17	104.6	554.3	83.2	82.1
62			0.147	0.77	76.9	8.00	-	13.65	-0.17	105.1	556.8	83.2	82.5
63			0.146	0.80	76.9	8.99	-	13.49	-0.17	105.3	559.9	83.1	82.1
64			0.145	0.79	76.9	9.19	-	13.30	-0.18	105.9	565.9	83.0	81.9
65			0.146	0.78	76.9	9.50	-	13.14	-0.17	106.1	573.3	83.0	82.5

# BOX A TEST DATA - ASTM E3053 / A

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Due to filters plugging, the sample filters were being changed during this interval. As a result the temperature probes were unplugged for these reading and recorded open channel values. These values were removed from the data set for clarity

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.146	0.80	76.9	10.09	-	12.94	-0.19	105.5	578.7	82.7	82.6
67			0.146	0.82	76.8	10.67	-	12.76	-0.19	105.4	583.6		82.7
68			0.145	0.80	76.7	10.03	-	12.56	-0.19	105.7	588.8		83.0
69			0.146	0.80	76.5	-0.01	-	12.36	-0.20	105.9	594.5		82.9
70	441.918	0.144	0.145	0.83	76.9	1.10	82	12.16	-0.20	106.5	600.6	85.0	82.6
71			0.145	0.81	76.9	0.71	-	11.94	-0.21	107.0	605.1	85.2	82.9
72			0.146	0.81	76.9	0.73	-	11.73	-0.21	107.4	608.3	84.9	82.4
73			0.144	0.86	76.9	0.74	-	11.52	-0.20	107.8	611.7	84.8	82.6
74			0.147	0.85	77.0	0.76	-	11.30	-0.23	107.9	615.1	84.8	82.2
75			0.146	0.86	77.0	0.78	-	11.07	-0.23	108.2	618.5	84.9	81.9
76			0.144	0.86	77.0	0.81	-	10.83	-0.24	108.6	623.0	84.8	82.4
77			0.146	0.86	77.1	0.80	-	10.60	-0.23	108.7	627.4	84.7	81.2
78			0.145	0.87	77.0	0.83	-	10.37	-0.23	109.1	633.2	84.9	79.9
79			0.146	0.87	77.0	0.84	-	10.11	-0.26	109.8	638.1	84.9	80.0
80	443.762	0.184	0.145	0.89	77.0	0.85	105	9.88	-0.23	110.2	644.6	84.8	80.0
81			0.145	0.91	77.0	0.88	-	9.65	-0.23	110.5	649.2	84.9	80.5
82			0.145	0.90	76.9	0.89	-	9.41	-0.24	110.6	653.2	84.9	80.3
83			0.145	0.92	77.0	0.91	-	9.14	-0.27	109.9	658.1	84.8	79.8
84			0.145	0.91	76.9	0.92	-	8.91	-0.23	109.5	660.4	84.7	81.0
85			0.145	0.93	76.9	0.94	-	8.66	-0.25	109.4	661.4	84.6	81.3
86			0.145	0.94	76.9	0.96	-	8.43	-0.23	109.0	663.8	84.7	81.1
87			0.145	0.95	76.9	0.97	-	8.22	-0.21	108.8	667.2	84.5	80.8
88			0.144	0.96	76.9	0.96	-	7.99	-0.23	108.3	672.1	84.4	80.8
89			0.144	0.96	76.9	0.96	-	7.76	-0.23	108.2	670.8	84.4	80.5
90	445.563	0.180	0.145	0.97	77.0	0.98	103	7.56	-0.20	107.2	658.0	84.3	80.6
91			0.147	0.99	76.9	0.97	-	7.38	-0.18	106.3	646.8	84.1	80.2
92			0.146	0.97	76.9	0.97	-	7.20	-0.18	105.2	637.9	84.1	79.9
93			0.146	1.00	76.9	0.97	-	7.04	-0.16	104.4	628.7	83.9	79.4
94			0.146	1.00	76.9	0.99	-	6.86	-0.18	103.8	620.6	83.8	79.8
95			0.146	1.01	76.9	0.99	-	6.71	-0.15	103.4	612.5	83.7	80.1
96			0.147	1.01	76.9	1.01	-	6.55	-0.16	102.8	604.0	83.5	79.8
97			0.146	1.04	76.9	1.00	-	6.40	-0.15	102.5	597.1	83.5	80.0
98			0.146	1.05	76.9	1.01	-	6.26	-0.14	102.1	590.9	83.3	80.0

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.147	1.03	76.9	1.01	-	6.11	-0.15	101.5	586.0	83.3	80.1
100	447.372	0.181	0.146	1.05	76.9	1.00	103	5.97	-0.14	101.5	582.1	83.2	80.1
101			0.147	1.05	77.0	1.01	-	5.85	-0.11	101.2	576.7	83.1	80.4
102			0.147	1.06	76.9	1.03	-	5.73	-0.13	102.5	571.1	83.2	82.5
103			0.146	1.03	76.9	1.03	-	5.59	-0.14	105.4	566.6	83.4	83.8
104			0.145	1.06	76.9	1.03	-	5.46	-0.12	106.9	563.1	83.5	84.5
105			0.146	1.08	76.9	1.04	-	5.34	-0.12	108.0	560.2	83.6	84.7
106			0.146	1.06	76.9	1.02	-	5.24	-0.10	108.5	557.2	83.8	85.1
107			0.144	1.04	77.0	1.03	-	5.12	-0.12	109.1	556.9	83.8	85.6
108			0.146	1.06	77.0	1.04	-	5.01	-0.11	109.5	556.2	83.9	85.7
109			0.145	1.04	77.0	1.05	-	4.93	-0.08	109.6	553.7	84.0	86.0
110	449.175	0.180	0.145	1.08	77.0	1.03	103	4.81	-0.13	109.7	550.7	84.1	85.8
111			0.145	1.07	77.0	1.04	-	4.71	-0.10	109.9	548.9	84.1	86.8
112			0.147	1.06	77.0	1.04	-	4.61	-0.10	110.5	545.6	84.3	87.0
113			0.146	1.05	77.0	1.07	-	4.52	-0.09	109.9	539.7	84.3	87.2
114			0.146	1.05	76.9	1.06	-	4.42	-0.10	109.6	533.8	84.4	86.9
115			0.146	1.06	77.0	1.07	-	4.33	-0.08	109.8	528.9	84.3	86.6
116			0.146	1.07	77.0	1.06	-	4.27	-0.06	109.9	526.3	84.3	86.3
117			0.145	1.06	77.0	1.06	-	4.18	-0.09	109.8	526.1	84.4	86.1
118			0.146	1.08	77.1	1.07	-	4.10	-0.08	109.8	528.1	84.4	87.2
119			0.146	1.07	77.1	1.07	-	4.01	-0.09	109.6	528.4	84.5	86.4
120	450.978	0.180	0.146	1.06	77.1	1.07	103	3.95	-0.07	109.5	521.0	84.6	86.6
121			0.146	1.07	77.1	1.07	-	3.86	-0.08	109.3	515.0	84.5	87.1
122			0.147	1.08	77.1	1.07	-	3.83	-0.03	109.0	508.5	84.5	86.4
123			0.147	1.07	77.1	1.07	-	3.77	-0.07	108.4	503.2	84.4	87.8
124			0.147	1.08	77.1	1.06	-	3.67	-0.10	108.0	498.5	84.4	89.0
125	451.888	0.182	0.147	1.09	77.2	1.07	104	3.59	-0.08	108.7	495.0	84.3	87.4
Avg/Tot	22.124	0.177	0.147	0.96	76.9	2.01	100			100.9	513.6	83.7	81.9

This value is final DGM value - Initial DGM value - Volume increase recorded during mid-test leak check procedures (0.036 ft3)

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	505.012		0.08	75.6	0.00		84.4	0.001	(0.05)	(0.043)	37.0	46.9
1			0.09	75.7	0.73	-	84.1	0.024	1.55	(0.003)	37.7	50.9
2			0.08	75.7	0.65	-	83.8	0.027	1.29	(0.002)	36.5	50.9
3			0.08	75.7	0.67	-	83.9	0.041	1.42	(0.013)	35.6	52.5
4			0.09	75.6	0.74	-	83.9	0.053	6.63	0.059	38.6	52.5
5			0.08	75.6	0.73	-	83.7	0.065	7.85	0.104	40.7	55.0
6			0.10	75.7	0.79	-	83.9	0.071	9.15	0.130	40.1	56.7
7			0.10	75.7	0.68	-	84.1	0.076	9.61	0.363	39.1	57.7
8			0.11	75.7	0.67	-	84.3	0.079	9.96	0.375	37.7	58.3
9			0.09	75.7	0.68	-	84.4	0.079	10.46	0.264	36.3	58.8
10	506.781	0.177	0.11	75.6	0.78	100	84.6	0.082	10.21	0.218	35.1	59.2
11			0.11	75.6	0.77	-	84.6	0.081	10.30	0.231	33.4	58.6
12			0.14	75.6	0.73	-	84.6	0.079	8.56	0.052	32.0	57.2
13			0.13	75.6	0.86	-	84.8	0.077	7.82	0.061	31.4	56.8
14			0.14	75.5	0.73	-	84.8	0.077	7.84	0.094	31.4	56.8
15			0.13	75.5	0.75	-	84.8	0.076	8.03	0.151	31.5	57.0
16			0.14	75.5	0.74	-	85.0	0.074	7.66	0.163	31.3	56.5
17			0.14	75.5	0.84	-	84.8	0.072	6.52	0.125	30.4	55.6
18			0.14	75.5	0.83	-	84.8	0.079	6.11	0.127	30.7	56.3
19			0.16	75.5	0.81	-	85.1	0.077	8.51	0.079	31.2	57.4
20	508.528	0.175	0.16	75.5	0.83	100	85.1	0.074	6.89	0.124	30.2	56.5
21			0.17	75.5	0.76	-	85.1	0.074	6.84	0.127	30.8	56.3
22			0.17	75.5	0.87	-	85.1	0.073	6.46	0.214	31.1	55.4
23			0.16	75.4	0.84	-	84.7	0.072	6.10	0.254	31.1	55.2
24			0.18	75.5	0.85	-	84.7	0.076	6.91	0.195	31.7	56.5
25			0.19	75.5	0.76	-	84.9	0.077	8.14	0.093	31.6	56.8
26			0.19	75.5	0.86	-	85.2	0.080	8.66	0.081	31.5	57.4
27			0.18	75.5	0.87	-	85.1	0.080	9.08	0.099	31.2	57.7
28			0.19	75.5	0.85	-	85.5	0.081	9.81	0.083	31.1	58.3
29			0.19	75.5	0.79	-	85.4	0.082	9.78	0.047	30.4	58.1
30	510.286	0.176	0.20	75.5	0.77	101	85.5	0.079	9.02	0.040	29.6	57.6
31			0.21	75.5	0.88	-	85.6	0.081	8.49	0.033	29.1	57.0
32			0.23	75.6	0.79	-	85.6	0.078	8.20	0.024	28.7	56.7
33			0.22	75.6	0.81	-	85.7	0.079	8.24	0.016	28.6	56.5
34			0.23	75.6	0.88	-	85.8	0.079	8.47	0.003	28.5	56.7
35			0.24	75.6	0.81	-	85.9	0.078	8.59	0.022	28.2	56.5
36			0.25	75.7	0.84	-	86.0	0.076	7.63	0.004	27.5	55.6
37			0.26	75.7	0.86	-	86.3	0.076	6.87	0.015	25.2	55.9
38			0.24	75.7	0.81	-	86.5	0.077	6.64	0.038	25.1	55.6

## BOX B TEST DATA - ASTM E3053 / A

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Due to filters plugging, the sample filters were being changed during this interval. As a result the temperature probes were unplugged for these reading and recorded open channel values. These values were removed from the data set for clarity

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.25	75.7	0.85	-	88.1	0.070	3.39	0.057	25.0	57.6
40	512.047	0.176	0.26	75.7	0.87	103	86.8	0.068	1.48	0.071	19.3	61.0
41			0.27	75.7	0.96	-	84.6	0.069	1.38	0.050	18.1	58.6
42			0.28	75.6	1.00	-	82.8	0.060	1.34	0.066	18.4	58.1
43			0.27	75.6	1.22	-	82.2	0.063	0.99	0.070	19.4	56.7
44			0.26	75.6	1.34	-	81.9	0.061	3.44	0.241	25.8	54.9
45			0.27	75.7	1.37	-	82.1	0.061	3.12	0.261	27.7	54.1
46			0.27	75.7	1.67	-	82.6	0.061	3.34	0.250	28.9	54.1
47			0.28	75.6	1.76	-	83.3	0.061	3.15	0.254	29.3	53.8
48			0.28	75.6	2.20	-	84.1	0.061	3.35	0.248	29.8	54.0
49			0.29	75.6	2.45	-	84.5	0.063	3.75	0.226	30.2	54.3
50	513.768	0.172	0.28	75.5	2.60	100	85.5	0.065	4.21	0.220	30.3	54.7
51			0.29	75.5	2.66	-	86.0	0.067	4.56	0.198	30.4	54.9
52			0.30	75.5	2.95	-	86.8	0.070	4.82	0.177	29.9	55.6
53			0.29	75.5	3.27	-	87.4	0.077	6.90	0.144	31.0	57.4
54			0.31	75.5	3.84	-	87.2	0.079	8.03	0.179	30.4	58.6
55			0.30	75.5	4.93	-	87.0	0.081	8.38	0.222	30.3	59.0
56			0.32	75.5	5.36	-	86.6	0.081	9.31	0.212	30.3	60.1
57			0.33	75.5	7.66	-	86.4	0.084	9.39	0.166	29.0	61.2
58			0.33	75.5	5.79	-	86.6	0.084	9.61	0.149	27.7	61.5
59			0.35	75.5	6.64	-	86.3	0.084	9.57	0.053	26.2	61.9
60	515.537	0.177	0.36	75.5	6.62	102	86.4	0.084	9.20	0.065	25.6	61.5
61			0.35	75.5	6.70	-	85.9	0.085	9.01	0.070	25.4	61.3
62			0.35	75.4	7.16	-	85.7	0.084	9.15	0.059	25.2	61.3
63			0.36	75.4	7.41	-	85.7	0.085	9.38	0.057	25.0	61.5
64			0.36	75.4	7.91	-	85.4	0.085	9.62	0.048	25.0	61.7
65			0.36	75.4	8.34	-	85.2	0.087	9.93	0.041	24.9	62.1
66			0.38	75.5	8.82	-	85.1	0.087	10.26	0.037	25.3	62.1
67			0.37	75.5	9.58	-	84.8	0.087	10.39	0.042	25.5	62.2
68			0.37	75.6	10.07	-	84.6	0.087	10.57	0.045	25.5	62.4
69			0.39	75.6	10.63	-	84.3	0.088	10.69	0.068	25.4	62.4
70	517.208	0.167	0.38	75.5	5.55	98	85.5	0.088	10.96	0.088	25.4	63.0
71			0.37	75.4	0.01	-	85.5	0.088	11.14	0.111	25.2	63.0
72			0.40	75.5	0.74	-	84.8	0.088	11.01	0.110	25.0	63.1
73			0.35	75.5	0.70	-	85.8	0.089	11.04	0.131	24.9	63.3
74			0.40	75.6	0.63	-	85.9	0.089	11.22	0.152	25.0	63.5
75			0.35	75.6	0.68	-	85.8	0.090	11.33	0.196	24.8	63.7
76			0.35	75.7	0.70	-	85.6	0.089	11.39	0.231	24.7	63.9
77			0.37	75.7	0.74	-	85.6	0.090	11.52	0.242	24.7	63.9



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.34	75.6	0.68	-	85.5	0.091	11.66	0.289	24.7	64.2
79			0.32	75.6	0.69	-	85.4	0.092	11.75	0.328	24.4	64.4
80	518.702	0.149	0.34	75.6	0.69	88	85.3	0.092	11.85	0.377	24.0	64.4
81			0.33	75.6	0.73	-	85.3	0.092	12.23	0.420	23.8	64.4
82			0.32	75.5	0.82	-	85.3	0.092	12.24	0.390	23.7	64.4
83			0.32	75.5	0.80	-	85.2	0.093	12.42	0.482	24.2	64.2
84			0.30	75.5	0.84	-	85.0	0.093	12.45	0.640	24.3	64.2
85			0.34	75.5	0.81	-	84.9	0.092	12.43	0.706	24.3	64.0
86			0.32	75.5	0.85	-	84.9	0.093	12.45	0.655	24.4	63.9
87			0.34	75.4	0.87	-	84.8	0.093	12.33	0.576	24.3	63.7
88			0.30	75.4	0.79	-	84.7	0.094	12.44	0.555	24.6	63.7
89			0.33	75.5	0.86	-	84.6	0.093	12.33	0.356	24.6	63.5
90	520.451	0.175	0.32	75.5	0.82	103	84.6	0.091	11.70	0.202	24.4	62.4
91			0.32	75.4	0.89	-	84.4	0.091	11.30	0.167	24.2	61.5
92			0.35	75.5	0.89	-	84.3	0.090	10.97	0.125	24.3	60.8
93			0.27	75.4	0.87	-	84.1	0.090	10.72	0.113	24.5	60.3
94			0.28	75.4	0.90	-	84.0	0.089	10.40	0.081	24.6	59.9
95			0.30	75.4	0.86	-	83.8	0.088	10.14	0.067	24.6	59.5
96			0.29	75.4	0.86	-	83.8	0.088	9.86	0.048	24.7	59.2
97			0.27	75.4	0.83	-	83.6	0.087	9.68	0.033	24.7	59.0
98			0.27	75.4	0.91	-	83.6	0.086	9.62	0.026	24.8	58.6
99			0.32	75.4	0.91	-	83.5	0.086	9.55	0.022	24.9	58.3
100	522.209	0.176	0.32	75.4	0.87	102	83.5	0.085	9.63	0.019	25.0	58.3
101			0.25	75.4	0.90	-	83.4	0.085	9.47	0.015	25.0	58.1
102			0.26	75.4	0.92	-	83.5	0.084	9.37	0.020	24.3	58.3
103			0.28	75.4	0.84	-	83.7	0.085	9.34	0.017	22.6	58.6
104			0.30	75.4	0.83	-	83.7	0.084	9.28	0.018	21.8	58.8
105			0.27	75.4	0.93	-	83.8	0.084	9.20	0.013	21.1	58.8
106			0.24	75.4	0.94	-	83.9	0.084	9.13	0.009	20.7	58.6
107			0.28	75.4	0.91	-	83.9	0.083	9.05	0.003	20.3	58.8
108			0.22	75.4	0.94	-	84.0	0.083	8.75	0.004	20.0	58.6
109			0.24	75.4	0.94	-	84.0	0.082	8.61	(0.007)	19.7	58.3
110	523.960	0.175	0.22	75.5	0.93	102	84.1	0.083	8.50	(0.010)	19.6	58.3
111			0.24	75.4	0.92	-	84.1	0.082	8.56	(0.012)	19.4	58.1
112			0.26	75.4	0.94	-	84.2	0.082	8.47	(0.012)	19.1	57.9
113			0.25	75.4	0.88	-	84.3	0.080	8.05	(0.016)	19.2	57.7
114			0.23	75.4	0.87	-	84.3	0.081	7.76	(0.016)	18.9	57.4
115			0.22	75.4	0.92	-	84.2	0.080	7.56	(0.019)	18.9	57.2
116			0.23	75.4	0.88	-	84.4	0.080	7.62	(0.016)	18.8	57.4

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.25	75.5	0.89	-	84.4	0.080	7.78	(0.017)	19.0	57.4
118			0.22	75.6	0.94	-	84.5	0.081	8.00	(0.011)	19.1	57.6
119			0.22	75.6	0.93	-	84.5	0.079	7.93	(0.024)	19.1	57.4
120	525.721	0.176	0.21	75.6	0.95	103	84.5	0.079	7.16	(0.023)	18.7	56.7
121			0.21	75.6	0.96	-	84.5	0.078	6.78	(0.021)	18.4	56.3
122			0.20	75.6	0.94	-	84.5	0.078	6.72	(0.019)	18.4	56.1
123			0.22	75.6	0.91	-	84.5	0.077	6.68	(0.019)	18.7	55.8
124			0.23	75.6	0.91	-	84.4	0.076	6.62	(0.016)	18.7	55.6
125	526.605	0.177	0.23	75.6	0.96	103	84.4	0.077	6.48	(0.015)	18.4	55.6
Avg/Tot	21.568	0.173	0.25	75.5	1.80	100	84.8	0.079	8.29	0.126	26.50	58.587

This value is final DGM value - Initial DGM value - Volume increase recorded during mid-test leak check procedures (0.025 ft3)

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 3

Technician: SJB

Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data						
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	202.889		0.40	75.1	1.00		84.0
1			0.40	75.2	1.00	-	83.9
2			0.40	75.1	1.00	-	83.8
3			0.40	75.1	1.00	-	83.7
4			0.40	75.2	1.00	-	83.6
5			0.40	75.2	1.00	-	83.5
6			0.40	75.2	1.00	-	83.8
7			0.40	75.2	1.00	-	84.0
8			0.40	75.2	1.00	-	84.0
9			0.40	75.2	1.00	-	83.9
10	204.109	0.122	0.40	75.3	1.00	95	83.7
11			0.40	75.3	1.00	-	83.5
12			0.40	75.3	1.00	-	83.5
13			0.40	75.3	1.00	-	83.5
14			0.40	75.3	1.00	-	83.4
15			0.40	75.4	1.00	-	83.5
16			0.40	75.4	1.00	-	83.4
17			0.40	75.4	1.00	-	83.3
18			0.40	75.5	1.00	-	83.3
19			0.40	75.5	1.00	-	83.3
20	205.374	0.126	0.40	75.5	1.00	100	83.3
21			0.40	75.5	1.00	-	83.3
22			0.40	75.5	1.00	-	83.2
23			0.40	75.6	1.00	-	83.1
24			0.40	75.6	1.00	-	83.2
25			0.40	75.6	1.00	-	83.2
26			0.40	75.6	1.00	-	83.2
27			0.40	75.6	1.00	-	83.2
28			0.40	75.6	1.00	-	83.3
29			0.40	75.6	1.00	-	83.3
30	206.646	0.127	0.40	75.6	1.00	100	83.2
31			0.40	75.6	1.00	-	83.2

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 3

Technician: SJB

Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data						
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.40	75.6	1.00	-	83.3
33			0.40	75.6	1.00	-	83.4
34			0.40	75.6	1.00	-	83.5
35			0.40	75.6	1.00	-	83.6
36			0.40	75.7	1.00	-	83.6
37			0.40	75.7	1.00	-	83.6
38			0.40	75.6	1.00	-	83.7
39			0.40	75.7	1.00	-	83.8
40	207.918	0.127	0.40	75.7	1.00	102	83.3
41			0.40	75.7	1.00	-	82.7
42			0.40	75.7	1.00	-	82.3
43			0.40	75.6	1.00	-	82.5
44			0.40	75.7	1.00	-	82.5
45			0.40	75.7	1.00	-	82.9
46			0.40	75.7	1.00	-	83.2
47			0.40	75.7	1.00	-	83.4
48			0.40	75.7	1.00	-	83.6
49			0.40	75.7	1.00	-	83.9
50	209.185	0.127	0.40	75.7	1.00	101	84.0
51			0.40	75.7	1.00	-	84.3
52			0.40	75.8	1.00	-	84.4
53			0.40	75.8	1.00	-	84.4
54			0.40	75.8	1.00	-	84.5
55			0.40	75.8	1.00	-	84.3
56			0.40	75.8	1.00	-	84.0
57			0.40	75.9	1.00	-	83.8
58			0.40	75.9	1.00	-	83.6
59			0.40	75.9	1.00	-	83.4
60	210.438	0.125	0.40	75.9	1.00	99	83.3
Avg/Tot	7.549	0.126	0.40	75.5	1.00	99	83.5

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
0	77.3	78.1	78.6	77.8	77.5	77.8	N/A	
1	84.4	78.0	78.7	77.8	77.5	79.3	N/A	
2	94.6	78.1	79.4	77.8	77.6	81.5	N/A	
3	107.1	78.1	81.3	78.0	77.9	84.5	N/A	
4	139.7	78.0	84.2	78.5	78.5	91.8	N/A	
5	193.0	78.0	88.3	79.2	79.5	103.6	N/A	
6	256.4	78.0	93.6	80.4	80.9	117.9	N/A	
7	324.2	78.1	100.1	81.9	82.7	133.4	N/A	
8	389.2	78.2	107.2	83.9	85.0	148.7	N/A	
9	448.9	78.5	114.4	86.4	87.8	163.2	N/A	
10	497.4	79.0	121.5	89.6	91.1	175.7	N/A	
11	537.2	79.7	128.6	93.4	95.0	186.7	N/A	
12	561.2	80.6	135.8	97.8	99.4	194.9	N/A	
13	574.4	81.6	143.1	102.8	104.3	201.2	N/A	
14	578.4	82.9	150.2	108.2	110.0	205.9	N/A	
15	578.5	84.5	157.5	113.9	116.4	210.2	N/A	
16	577.5	86.2	164.8	119.5	123.5	214.3	N/A	
17	572.5	88.0	172.1	125.1	130.9	217.7	N/A	
18	567.8	89.9	179.3	130.6	138.3	221.2	N/A	
19	571.5	92.0	186.4	135.8	145.8	226.3	N/A	
20	570.8	94.3	193.8	141.0	153.1	230.6	N/A	
21	568.4	96.9	200.9	145.9	159.8	234.4	N/A	
22	566.3	99.9	207.6	150.9	165.8	238.1	N/A	
23	563.1	103.2	213.6	155.9	171.6	241.5	N/A	
24	563.2	106.9	219.1	161.0	177.2	245.5	N/A	
25	572.4	110.8	224.8	166.4	182.5	251.4	N/A	
26	584.2	114.8	230.4	172.1	188.2	258.0	N/A	
27	599.3	118.8	236.4	177.9	193.8	265.3	N/A	
28	617.6	123.0	242.9	184.0	199.3	273.4	N/A	
29	633.0	127.3	250.4	190.3	204.5	281.1	N/A	
30	644.3	131.7	258.7	196.9	209.6	288.2	N/A	
31	649.6	136.1	267.1	203.5	214.6	294.2	N/A	
32	651.3	140.6	275.3	210.3	219.6	299.4	N/A	
33	650.0	145.3	283.1	217.1	224.6	304.0	N/A	
34	649.4	150.0	290.6	223.8	229.7	308.7	N/A	
35	647.8	154.8	297.8	230.3	235.0	313.1	N/A	
36	648.0	159.6	304.7	236.5	240.3	317.8	N/A	
37	643.6	164.6	311.4	241.9	245.5	321.4	N/A	
38	637.5	169.5	317.4	247.4	250.7	324.5	N/A	
39	619.3	175.3	324.6	253.3	256.7	325.8	N/A	
40	583.0	181.2	331.4	258.6	262.4	323.3	N/A	
41	550.1	186.7	334.7	263.7	268.0	320.6	N/A	
42	521.3	192.1	334.3	268.5	273.1	317.9	N/A	
43	493.3	197.2	332.0	272.7	277.4	314.5	N/A	
44	480.0	201.7	327.7	276.2	280.6	313.2	N/A	
45	469.9	205.6	322.5	279.0	283.1	312.0	N/A	
46	462.2	209.2	317.0	280.9	284.8	310.8	N/A	
47	455.6	212.4	311.6	282.3	286.2	309.6	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	449.9	215.3	306.6	282.9	286.8	308.3	N/A
49	445.8	217.8	301.4	283.0	287.0	307.0	N/A
50	444.9	220.4	296.7	282.8	287.0	306.3	N/A
51	445.9	222.5	292.3	282.4	286.7	305.9	N/A
52	450.3	224.4	287.9	281.8	285.8	306.0	N/A
53	464.7	226.1	283.7	281.3	285.3	308.2	N/A
54	486.8	228.2	280.3	280.7	284.2	312.1	N/A
55	513.7	229.8	277.7	280.5	283.3	317.0	N/A
56	545.0	231.7	276.0	280.3	282.4	323.1	N/A
57	577.1	233.4	274.9	280.3	281.1	329.4	N/A
58	607.6	235.2	274.5	280.5	279.5	335.5	N/A
59	632.8	236.5	274.6	280.9	278.2	340.6	N/A
60	651.6	238.4	275.3	281.8	277.1	344.9	N/A
61	665.1	240.2	276.5	282.5	276.3	348.1	N/A
62	676.6	242.1	278.1	283.6	275.8	351.2	N/A
63	686.6	244.4	279.9	284.7	275.7	354.3	N/A
64	697.0	246.4	281.9	285.9	275.9	357.4	N/A
65	707.7	248.7	284.2	286.9	276.2	360.8	N/A
66	717.9	251.1	286.7	287.9	276.9	364.1	N/A
67	728.8	253.5	289.3	289.2	277.6	367.7	N/A
68	737.8	255.7	292.0	290.5	278.5	370.9	N/A
69	747.0	258.0	294.9	291.9	279.7	374.3	N/A
70	757.5	260.3	297.8	293.8	281.2	378.1	N/A
71	767.4	262.6	300.8	295.9	282.7	381.9	N/A
72	776.2	264.3	303.8	297.1	284.0	385.1	N/A
73	787.5	267.0	306.7	299.1	285.0	389.1	N/A
74	796.4	269.0	309.6	301.4	286.5	392.6	N/A
75	803.8	271.9	312.6	304.3	288.0	396.1	N/A
76	809.6	273.9	315.8	306.7	289.9	399.2	N/A
77	818.2	277.4	319.0	309.6	292.0	403.2	N/A
78	828.0	280.4	322.2	313.1	294.4	407.6	N/A
79	836.0	282.8	325.3	316.4	296.2	411.3	N/A
80	844.3	286.1	328.6	319.9	298.4	415.5	N/A
81	853.0	288.9	332.0	323.4	300.5	419.6	N/A
82	859.7	291.6	335.7	327.1	302.4	423.3	N/A
83	867.4	295.0	339.5	331.1	305.0	427.6	N/A
84	872.3	297.2	343.5	334.7	307.6	431.1	N/A
85	875.9	299.8	347.5	338.1	310.1	434.3	N/A
86	883.0	302.9	352.0	341.4	312.6	438.4	N/A
87	883.4	305.7	356.5	345.0	314.9	441.1	N/A
88	886.8	309.2	361.2	348.6	317.5	444.7	N/A
89	888.6	312.7	366.1	352.6	320.0	448.0	N/A
90	887.2	315.7	371.5	356.1	322.6	450.6	N/A
91	880.2	318.2	377.5	359.9	325.4	452.3	N/A
92	869.7	320.5	383.9	363.3	328.4	453.1	N/A
93	859.6	323.0	390.1	366.7	331.5	454.2	N/A
94	849.8	325.3	396.1	370.1	334.8	455.2	N/A
95	837.5	328.2	401.8	373.1	338.4	455.8	N/A

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
96	824.6	330.7	407.1	376.3	342.3	456.2	N/A	
97	813.7	332.7	412.2	379.1	346.2	456.8	N/A	
98	802.6	334.9	417.1	381.7	349.8	457.2	N/A	
99	793.0	336.2	421.7	384.0	353.3	457.7	N/A	
100	785.4	337.6	426.1	386.8	356.8	458.5	N/A	
101	778.5	339.6	430.3	389.0	360.0	459.5	N/A	
102	770.4	342.0	434.3	393.1	364.6	460.9	N/A	
103	764.2	343.8	438.3	396.7	368.7	462.3	N/A	
104	757.2	345.5	442.2	399.6	372.4	463.4	N/A	
105	751.9	347.1	445.9	402.2	376.1	464.6	N/A	
106	746.9	348.3	449.6	404.6	379.2	465.7	N/A	
107	743.5	349.9	453.2	406.8	382.5	467.2	N/A	
108	741.6	351.3	456.7	408.9	385.5	468.8	N/A	
109	737.3	352.8	459.8	411.1	388.2	469.8	N/A	
110	734.2	353.8	462.6	413.0	391.1	470.9	N/A	
111	730.7	354.8	465.0	414.7	393.8	471.8	N/A	
112	728.3	355.7	467.2	416.2	396.4	472.8	N/A	
113	722.6	356.8	469.2	417.5	398.6	472.9	N/A	
114	716.0	357.3	471.4	418.7	400.7	472.8	N/A	
115	710.0	358.1	473.6	419.9	403.2	473.0	N/A	
116	703.2	358.8	476.0	420.5	405.2	472.7	N/A	
117	698.6	359.6	478.2	421.2	407.0	472.9	N/A	
118	695.0	360.8	480.6	421.8	408.8	473.4	N/A	
119	693.8	361.4	482.9	421.9	410.3	474.1	N/A	
120	690.1	361.9	485.5	421.9	411.8	474.2	N/A	
121	685.2	362.6	487.7	422.1	413.3	474.2	N/A	
122	678.1	363.4	490.2	422.1	414.4	473.7	N/A	
123	673.3	363.9	492.4	422.1	416.0	473.6	N/A	
124	667.5	364.6	494.6	422.2	416.7	473.1	N/A	
125	660.4	365.4	496.5	421.7	417.7	472.3	N/A	
Average	642.7	231.9	310.6	278.4	270.3	347	N/A	

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0140 / H0164	375.2	380.0	4.8
	<b>B</b>	H0141 / H0165	367.0	372.2	5.2
	<b>C - 1st Hour</b>	H0142	188.1	191.1	3.0
	<b>Amb</b>	H0154	95.6	95.6	0.0
<b>Probes</b>	<b>A</b>	6A	116382.0	116382.3	0.3
	<b>B</b>	6B	115953.4	115953.6	0.2
	<b>C - 1st Hour</b>	6C	115127.9	115128.0	0.1
<b>O-rings</b>	<b>A</b>	6A	3614.2	3614.3	0.1
	<b>B</b>	6B	3396.4	3396.8	0.4
	<b>C - 1st Hour</b>	6C	3401.2	3401.4	0.2

**Placed in Desiccator on:** 6/12 - 10:30

**Balance Audit (mg):** 100.0 100.0 100.0 100.0

*Undesiccated                      Dessicated                      Dessicated                      Desiccated*

<b>Filters</b>	<b>A</b>	191.6/188.3	6/7 - 11:20 / 6/7 - 18:00	379.9	6/14 10:44	380.0	6/15 12:31		
	<b>B</b>	192.1/180.2	6/7 - 11:20 / 6/7 - 18:00	372.2	6/14 10:44	372.2	6/15 12:31		
	<b>C - 1st Hour</b>	191.5	6/7 11:22	191.0	6/14 10:44	191.1	6/15 12:31		
	<b>Amb</b>	95.5	6/7 12:15	95.5	6/14 10:44	95.6	6/15 12:32		
<b>Probes</b>	<b>A</b>			116382.2	6/14 10:54	116382.5	6/15 12:43	116382.3	6/16 8:57
	<b>B</b>			115953.6	6/14 10:54	115953.6	6/15 12:43		
	<b>C - 1st Hour</b>			115128.1	6/14 10:55	115128.0	6/15 12:43		
<b>O-Rings</b>	<b>A</b>			3614.1	6/14 10:34	3614.3	6/15 12:21		
	<b>B</b>			3396.7	6/14 10:34	3396.8	6/15 12:21		
	<b>C - 1st Hour</b>			3401.3	6/14 10:35	3401.4	6/15 12:22		

<b>Train A Aggregate, mg:</b>	<b>5.2</b>
<b>Train B Aggregate, mg:</b>	<b>5.8</b>
<b>Train C Aggregate, mg:</b>	<b>3.3</b>
<b>Ambient Aggregate, mg:</b>	<b>0.0</b>



**WOOD STOVE TEST DATA PACKET**  
**ASTM E3053/E2515**



**Run 4 Data Summary**

Client: SBI  
Model: 1.7R  
Job #: 23-161  
Tracking #: 135  
Test Date: 6/7/2023

  
\_\_\_\_\_  
Technician Signature

7/3/2023  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI

Model: 1.7R

Run #: 4

Job #: 23-161

Tracking #: 135

Technician: SJB

Date: 6/7/2023

<b>Burn Rate (kg/hr):</b>	<b>1.14</b>
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	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	63.759	64.257	63.046	7.667
Average Gas Velocity in Dilution Tunnel (ft/sec)	25.03			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	28778.9			
Average Gas Meter Temperature (°F)	85.8	77.3	75.8	76.8
Total Sample Volume (dscf)	61.146	63.580	62.195	7.402
Average Tunnel Temperature (°F)	94.9			
Total Time of Test (min)	345			
Total Particulate Catch (mg)	0.1	4.4	4.0	1.3
Particulate Concentration, dry-standard (g/dscf)	0.0000016	0.0000692	0.0000643	0.0001756
Total PM Emissions (g)	0.27	11.18	10.37	5.01
Particulate Emission Rate (g/hr)	0.05	1.94	1.80	5.01
Emissions Factor (g/kg)	-	1.70	1.58	-
Difference from Average Total Particulate Emissions (g)	-	0.40	0.40	-
Difference from Average Total Particulate Emissions (%)	-	3.8%	3.8%	-
Difference from Average Emissions Factor (g/kg)	-	0.06	0.06	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	10.78
Particulate Emission Rate (g/hr)	1.87
Emissions Factor (g/kg)	1.64
HHV Efficiency (%)	66.6%
LHV Efficiency (%)	71.4%
CO Emissions (g/min)	0.78

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: 88.5	OK
Face Velocity	< 30 ft/min	10.3	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min:79.8/Max:89.6	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 06/07/23  
**Run:** 4  
**Control #:** 23-161  
**Test Duration:** 345  
**Output Category:** Medium

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	66.6%	71.4%
<b>Combustion Efficiency</b>	97.6%	97.6%
<b>Heat Transfer Efficiency</b>	68.3%	73.1%

<b>Output Rate (kJ/h)</b>	14,304	13,569	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.14	2.52	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	21,469	20,366	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.57	14.47	<b>dry lb</b>
<b>MC wet (%)</b>	16.94		
<b>MC dry (%)</b>	20.39		
<b>Particulate (g )</b>	10.78		
<b>CO (g)</b>	267		
<b>Test Duration (h)</b>	5.75		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.13	3.25
<b>g/kg Dry Fuel</b>	1.64	40.72
<b>g/h</b>	1.87	46.50
<b>g/min</b>	0.03	0.78
<b>lb/MM Btu Output</b>	0.30	7.56

<b>Air/Fuel Ratio (A/F)</b>	25.11
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VERSION:

2.4

4/15/2010

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking # 135  
 Technician: SJB  
 Date: 6/7/2023

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.89  
 Max Allowable Start-up Fuel Weight (lbs): 4.33

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.25	2.83	In Range	17.5	24.6	19.5	20.5	In Range	2.35	1.06
2	15.75	3.01	In Range	17.9	27.2	22.0	22.4	In Range	2.46	1.12
3	15.75	2.55	In Range	23.8	25.5	16.8	22.0	In Range	2.09	0.95
Core Load Wt. (lbs)		8.39	In Range							

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	2.37	In Range	19.4	24.4	20.2	21.3	In Range	1.95	0.89
2	16.00	3.67	In Range	19.1	18.7	19.5	19.1	In Range	3.08	1.40
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.04	In Range							

Total Load Weight (lbs): 14.43 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: 100% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.0  
 Total Load Average Moisture Content (%DB): 20.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.3  
 Total Test Load Weight (dry basis): 11.93 lbs 5.41 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.86	In Range	10	10	10	10.0	In Range	2.60	1.18

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.29	In Range	20.3	21.7	20.5	20.8	In Range	3.55	1.61

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.4 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 2.05 In Range

# LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking # 135  
 Technician: SJB  
 Date: 6/7/2023

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 12  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 17.28  
 Total Load Weight Range (lbs): 16.42 to 18.14  
 Core Load Weight Range (lbs): 7.78 to 11.23  
 Remainder Load Weight Range (lbs): 6.05 to 9.50  
 Core Load Piece Range (lbs): 2.59 to 4.32  
 Remainder Load Piece Range (lbs): 1.73 to 5.18

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	3.77	In Range	20.3	20.0	19.0	19.8	In Range	3.15	1.43
2	15.75	3.53	In Range	26.7	19.5	17.0	21.1	In Range	2.92	1.32
3	16.00	3.54	In Range	18.6	19.3	18.3	18.7	In Range	2.98	1.35
Core Load Wt. (lbs)		10.85	In Range							

### REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	2.51	In Range	18.6	27.8	16.4	20.9	In Range	2.07	0.94
2	16.25	4.07	In Range	18.1	25.2	21.3	21.5	In Range	3.34	1.52
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.57	In Range							

Remainder Load Small/Large Piece Weight Ratio: 62% In Range ≤ 67%  
 Total Load Weight (lbs): 17.42 In Range  
 Core Load % of Total Weight: 62% In Range 45-65%  
 Remainder % of Total Weight: 38% In Range 35-55%  
 Total Load % of Target Weight: 101% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 12.1  
 Total Load Average Moisture Content (%DB): 20.4 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.9  
 Total Test Load Weight (dry basis): 14.47 lbs 6.56 kg

### TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 1.8 to 3.4  
 Actual Charcoal Bed Wt. (lb): 3.30 In Range

### TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.00 Valid Test (≥90%)

Total Fuel Burned During Test Run:  
 17.4 lbs, wet basis  
 14.5 lbs, dry basis  
 6.56 kg, dry basis

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4  
 Test Start Time: 11:53  
 Test Type: Medium Fire

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Recording Interval (min): 1  
 Total Sampling Time (min): 345

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0.0005  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 6/5/2023  
 Test Fuel Scale Audit (kg): 5.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.34	29.42	29.38
Relative Humidity (%)	37.7	38.3	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Platform Scale Audit (kg)	5.0	5.0	
Ambient Sample Volume:	63.759		ft <sup>3</sup>

### Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.001	0.000	cfm @	-5 in. Hg
(B)	0.001	0.002	cfm @	-5 in. Hg
(C)	0.000	0.001	cfm @	-5 in. Hg
(Ambient)	0.000	0.000	cfm @	-5 in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.124	76
2	0.146	76
3	0.146	76
4	0.134	76
5	0.104	76
6	0.142	76
7	0.147	76
8	0.134	76
Center	0.152	76

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

$V_{strav}$ : 24.72 ft/sec  
 $V_{scent}$ : 26.30 ft/sec  
 $F_p$ : 0.940 [ratio]  
 Initial Tunnel Flow: 490.0 scf/min

Static Pressure: -0.314 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

## WOODSTOVE PREBURN DATA

Client: SBI \_\_\_\_\_  
Model: 1.7R \_\_\_\_\_  
Run #: 4 \_\_\_\_\_

Job #: 23-161 \_\_\_\_\_  
Tracking #: 135 \_\_\_\_\_  
Technician: SJB \_\_\_\_\_  
Date: 6/7/2023 \_\_\_\_\_

**Medium Fire Performed as a continuation of High Fire Test, see Run 3 test data for details**

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	451.888		0.139	1.10	76.6	0.00		20.70		127.9	463.4	83.2	86.8
1			0.141	1.12	77.2	0.66	-	20.60	-0.10	127.6	409.4	87.7	86.1
2			0.139	1.12	77.2	0.66	-	20.43	-0.16	130.5	411.2	88.5	86.9
3			0.137	1.13	77.2	0.67	-	20.22	-0.22	137.0	452.5	88.1	87.7
4			0.135	1.13	77.3	0.66	-	19.89	-0.32	151.4	548.5	88.5	89.4
5			0.142	1.14	77.3	0.66	-	19.56	-0.34	126.6	589.7	87.1	88.2
6			0.144	1.14	77.3	0.67	-	19.29	-0.27	119.2	598.9	86.2	88.1
7			0.144	1.15	77.2	0.67	-	19.09	-0.20	116.1	591.4	86.0	88.4
8			0.143	1.15	77.3	0.67	-	18.87	-0.21	114.5	584.9	86.0	88.7
9			0.145	1.15	77.3	0.66	-	18.67	-0.20	115.3	586.9	86.3	88.4
10	453.723	0.184	0.145	1.17	77.3	0.68	104	18.48	-0.19	114.8	583.1	86.4	88.3
11			0.146	1.18	77.2	0.67	-	18.31	-0.17	113.9	576.7	86.4	89.2
12			0.146	1.16	77.2	0.66	-	18.14	-0.18	112.4	573.0	86.2	87.0
13			0.145	1.18	77.1	0.67	-	18.02	-0.12	110.9	567.2	86.1	87.2
14			0.146	1.18	77.2	0.66	-	17.85	-0.17	109.9	561.9	86.0	86.3
15			0.146	1.19	77.3	0.67	-	17.72	-0.13	109.2	558.3	85.8	86.2
16			0.147	1.17	77.3	0.67	-	17.56	-0.16	108.7	557.0	85.7	86.1
17			0.146	1.17	77.3	0.67	-	17.41	-0.15	108.5	554.9	85.7	86.1
18			0.147	1.18	77.2	0.68	-	17.25	-0.16	108.4	553.8	85.7	86.2
19			0.146	1.18	77.2	0.66	-	17.08	-0.17	108.3	554.0	85.7	86.1
20	455.528	0.181	0.146	1.18	77.3	0.66	100	16.92	-0.16	108.1	554.4	85.6	86.4
21			0.146	1.18	77.3	0.67	-	16.76	-0.16	108.2	556.1	85.4	86.5
22			0.146	1.18	77.3	0.66	-	16.59	-0.17	108.3	558.0	85.4	86.5
23			0.147	1.16	77.3	0.68	-	16.40	-0.18	108.2	559.2	85.3	86.6
24			0.146	1.19	77.3	0.65	-	16.23	-0.17	108.4	562.0	85.3	86.4
25			0.147	1.19	77.2	0.66	-	16.06	-0.18	108.6	565.5	85.3	85.9
26			0.146	1.20	77.2	0.65	-	15.87	-0.18	108.8	568.2	85.2	86.1
27			0.146	1.20	77.1	0.68	-	15.70	-0.18	108.8	570.7	85.2	86.6
28			0.147	1.20	77.1	0.68	-	15.50	-0.19	108.9	573.9	85.2	86.5
29			0.147	1.21	77.1	0.68	-	15.33	-0.17	108.9	574.8	85.1	85.4
30	457.327	0.180	0.146	1.20	77.2	0.68	99	15.16	-0.17	108.7	575.8	85.1	86.9
31			0.145	1.22	77.2	0.67	-	14.97	-0.19	108.4	577.4	85.1	87.2
32			0.147	1.21	77.2	0.68	-	14.78	-0.19	108.5	578.8	85.1	86.3



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.146	1.19	77.2	0.69	-	14.58	-0.20	108.3	580.4	85.1	86.9
34			0.147	1.21	77.2	0.71	-	14.39	-0.20	108.3	582.2	85.1	87.1
35			0.146	1.21	77.2	0.72	-	14.19	-0.19	108.3	584.7	85.0	86.8
36			0.147	1.21	77.1	0.73	-	14.01	-0.18	108.6	586.7	84.9	85.8
37			0.147	1.24	77.2	0.74	-	13.82	-0.19	108.6	587.2	84.9	85.4
38			0.147	1.21	77.2	0.76	-	13.62	-0.20	108.6	588.2	84.9	84.7
39			0.147	1.21	77.2	0.79	-	13.41	-0.22	108.8	589.2	84.9	84.1
40	459.122	0.180	0.146	1.24	77.2	0.82	99	13.22	-0.18	108.8	590.9	85.0	83.6
41			0.147	1.22	77.2	0.83	-	13.00	-0.22	108.8	592.6	85.0	82.8
42			0.146	1.21	77.2	0.85	-	12.82	-0.18	108.8	591.5	85.0	82.0
43			0.147	1.24	77.2	0.85	-	12.63	-0.19	108.6	586.0	85.0	82.2
44			0.147	1.23	77.2	0.84	-	12.46	-0.17	107.3	581.7	84.9	81.9
45			0.146	1.26	77.2	0.86	-	12.27	-0.19	106.2	578.2	84.9	82.2
46			0.147	1.25	77.2	0.85	-	12.11	-0.16	105.2	574.9	84.7	82.4
47			0.147	1.24	77.2	0.85	-	11.94	-0.17	104.3	572.1	84.6	82.2
48			0.148	1.24	77.2	0.87	-	11.77	-0.17	103.2	569.2	84.3	82.7
49			0.147	1.24	77.2	0.87	-	11.62	-0.15	102.7	566.5	84.3	82.2
50	460.964	0.184	0.148	1.24	77.2	0.87	101	11.47	-0.16	102.0	564.9	84.1	82.2
51			0.149	1.22	77.2	0.88	-	11.30	-0.16	101.8	564.6	84.0	81.5
52			0.148	1.20	77.2	0.88	-	11.15	-0.15	101.4	563.2	83.9	80.7
53			0.147	1.20	77.2	0.88	-	10.97	-0.18	100.8	561.8	84.0	80.4
54			0.148	1.22	77.2	0.88	-	10.81	-0.16	100.4	560.5	83.8	80.1
55			0.147	1.23	77.2	0.90	-	10.65	-0.16	100.3	559.8	83.8	80.1
56			0.148	1.22	77.2	0.89	-	10.52	-0.13	99.8	559.0	83.9	79.8
57			0.148	1.22	77.2	0.91	-	10.35	-0.18	99.6	557.5	84.2	79.9
58			0.148	1.22	77.3	0.90	-	10.21	-0.14	99.5	556.0	84.4	80.1
59			0.148	1.25	77.3	0.91	-	10.06	-0.15	99.3	555.5	84.5	80.4
60	462.800	0.184	0.148	1.23	77.3	0.91	100	9.92	-0.14	99.3	554.2	84.8	80.6
61			0.149	1.21	77.3	0.91	-	9.80	-0.12	99.5	553.7	85.0	80.6
62			0.149	1.22	77.2	0.92	-	9.65	-0.15	99.2	553.0	85.1	80.6
63			0.148	1.22	77.2	0.93	-	9.50	-0.15	99.1	552.3	85.4	80.5
64			0.149	1.22	77.3	0.94	-	9.37	-0.13	98.8	550.5	85.5	80.7
65			0.148	1.20	77.3	0.96	-	9.26	-0.11	98.5	547.7	85.7	80.4

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.149	1.24	77.3	0.93	-	9.14	-0.12	100.1	546.0	85.9	80.3
67			0.148	1.23	77.4	0.93	-	9.03	-0.11	100.8	544.7	86.0	80.1
68			0.148	1.21	77.4	0.94	-	8.93	-0.11	101.2	542.2	86.5	79.8
69			0.148	1.23	77.4	0.94	-	8.80	-0.13	101.2	540.0	86.6	80.3
70	464.645	0.184	0.149	1.21	77.5	0.95	100	8.71	-0.09	101.3	537.9	86.7	80.4
71			0.148	1.21	77.5	0.95	-	8.59	-0.11	101.4	536.3	86.9	80.7
72			0.148	1.22	77.5	0.96	-	8.48	-0.11	101.9	534.7	87.0	82.8
73			0.149	1.21	77.6	0.98	-	8.38	-0.10	102.5	535.5	86.9	83.6
74			0.148	1.20	77.6	0.96	-	8.28	-0.10	102.9	537.4	86.7	84.2
75			0.148	1.22	77.6	0.96	-	8.20	-0.08	103.6	534.2	86.7	85.1
76			0.148	1.22	77.7	0.97	-	8.12	-0.08	105.2	527.6	86.5	85.8
77			0.148	1.21	77.6	0.96	-	8.04	-0.08	105.7	520.5	86.6	85.8
78			0.147	1.20	77.7	0.98	-	7.95	-0.09	106.2	514.1	86.4	86.0
79			0.148	1.21	77.7	0.97	-	7.88	-0.07	106.6	508.3	86.5	86.9
80	466.488	0.184	0.149	1.23	77.7	0.97	100	7.80	-0.08	106.7	503.7	86.4	87.0
81			0.149	1.24	77.7	0.98	-	7.75	-0.05	106.3	498.9	86.3	86.6
82			0.148	1.24	77.7	0.98	-	7.66	-0.08	106.6	494.2	86.1	86.7
83			0.148	1.25	77.6	0.97	-	7.61	-0.06	106.8	490.7	86.2	87.1
84			0.148	1.26	77.6	0.98	-	7.54	-0.06	106.5	487.2	86.0	86.9
85			0.149	1.27	77.6	0.98	-	7.50	-0.04	106.4	483.8	85.9	86.6
86			0.149	1.23	77.6	0.97	-	7.43	-0.07	106.3	479.4	85.8	87.7
87			0.148	1.27	77.6	0.98	-	7.37	-0.06	106.7	476.4	85.7	87.7
88			0.148	1.25	77.6	0.97	-	7.30	-0.06	106.3	472.4	85.6	88.2
89			0.148	1.25	77.6	0.95	-	7.27	-0.04	105.7	465.9	85.5	88.3
90	468.322	0.183	0.149	1.25	77.6	0.97	100	7.25	-0.02	104.1	458.9	85.5	86.5
91			0.150	1.19	77.5	0.97	-	7.23	-0.02	103.3	453.0	85.3	86.2
92			0.149	1.17	77.5	0.97	-	7.21	-0.02	102.7	446.5	85.1	86.8
93			0.149	1.25	77.4	0.99	-	7.18	-0.03	101.9	439.6	85.1	87.0
94			0.149	1.24	77.5	0.98	-	7.14	-0.04	102.6	431.9	85.0	86.4
95			0.148	1.22	77.5	0.98	-	7.08	-0.06	103.1	425.5	84.9	85.9
96			0.148	1.11	77.5	0.97	-	7.06	-0.02	102.8	416.6	84.8	86.4
97			0.148	1.10	77.5	0.99	-	7.00	-0.06	101.9	408.0	84.7	88.1
98			0.150	1.16	77.6	0.96	-	6.94	-0.06	101.7	399.0	84.5	88.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.149	1.17	77.6	0.97	-	6.88	-0.06	101.6	392.5	84.4	88.0
100	470.168	0.185	0.148	1.06	77.5	0.96	100	6.85	-0.04	101.7	385.8	84.3	87.3
101			0.149	1.20	77.5	0.96	-	6.81	-0.04	101.0	380.1	84.2	89.0
102			0.150	1.18	77.6	0.95	-	6.76	-0.05	100.7	375.0	84.1	89.6
103			0.151	1.03	77.5	0.94	-	6.72	-0.05	100.9	370.5	84.0	88.1
104			0.150	0.94	77.6	0.92	-	6.68	-0.03	100.9	366.4	83.9	86.7
105			0.150	0.99	77.5	0.91	-	6.65	-0.03	100.7	362.7	83.9	86.6
106			0.150	0.90	77.6	0.90	-	6.63	-0.02	100.3	359.1	83.8	86.5
107			0.149	0.95	77.6	0.87	-	6.61	-0.02	100.2	355.8	83.8	86.2
108			0.149	0.65	77.6	0.89	-	6.58	-0.03	100.0	352.9	83.8	86.5
109			0.150	1.08	77.6	0.89	-	6.55	-0.03	99.6	349.8	83.8	87.9
110	472.011	0.184	0.150	0.92	77.6	0.88	100	6.51	-0.05	99.3	347.0	83.7	86.7
111			0.152	0.85	77.5	0.88	-	6.47	-0.03	99.2	344.4	83.5	86.7
112			0.150	0.82	77.5	0.88	-	6.45	-0.02	99.0	342.1	83.5	86.6
113			0.151	0.71	77.5	0.87	-	6.41	-0.04	98.5	339.8	83.5	87.6
114			0.151	0.81	77.5	0.89	-	6.37	-0.04	98.3	338.0	83.4	87.2
115			0.151	0.72	77.5	0.90	-	6.34	-0.03	98.1	335.9	83.3	87.4
116			0.150	0.67	77.5	0.90	-	6.31	-0.03	97.9	333.7	83.4	88.1
117			0.151	0.66	77.4	0.90	-	6.27	-0.04	97.9	332.1	83.3	87.3
118			0.150	0.71	77.4	0.88	-	6.24	-0.03	98.0	330.4	83.2	87.0
119			0.152	0.60	77.4	0.90	-	6.19	-0.04	97.8	328.8	83.1	86.9
120	473.853	0.184	0.152	0.70	77.4	0.92	99	6.17	-0.02	97.6	327.2	83.0	87.0
121			0.150	0.71	77.4	0.92	-	6.14	-0.03	97.3	325.7	83.1	88.1
122			0.150	0.64	77.4	0.93	-	6.11	-0.03	97.4	324.2	83.3	87.0
123			0.151	0.53	77.4	0.96	-	6.06	-0.04	97.2	322.8	83.5	86.4
124			0.150	0.59	77.4	0.95	-	6.05	-0.02	97.1	321.3	83.7	86.7
125			0.151	0.67	77.4	0.96	-	6.01	-0.04	97.0	320.6	84.0	86.2
126			0.151	0.67	77.3	0.97	-	5.98	-0.03	96.8	320.2	84.3	86.6
127			0.151	0.73	77.3	0.99	-	5.94	-0.04	96.7	319.7	84.3	86.8
128			0.150	0.75	77.3	0.98	-	5.91	-0.03	96.8	323.8	84.5	86.6
129			0.149	0.69	77.3	0.99	-	5.88	-0.03	96.8	328.8	84.8	86.1
130	475.687	0.183	0.149	0.74	77.3	0.97	99	5.85	-0.02	96.7	329.9	85.0	86.2
131			0.150	0.72	77.4	0.98	-	5.83	-0.02	96.7	329.9	85.1	86.6

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132			0.150	0.77	77.4	0.96	-	5.82	-0.01	96.6	325.3	85.3	86.5
133			0.151	0.79	77.3	0.96	-	5.80	-0.02	96.3	321.4	85.6	86.1
134			0.151	0.81	77.3	0.97	-	5.78	-0.02	96.2	318.3	85.5	86.1
135			0.151	0.78	77.3	0.95	-	5.77	-0.02	96.0	315.8	85.8	86.0
136			0.150	0.83	77.3	0.95	-	5.75	-0.02	96.0	313.5	85.9	86.3
137			0.150	0.84	77.3	0.95	-	5.73	-0.02	95.8	311.7	86.0	86.0
138			0.151	0.96	77.3	0.95	-	5.71	-0.02	95.8	309.8	86.2	86.0
139			0.151	0.98	77.3	0.96	-	5.73	0.01	95.6	308.6	86.2	86.0
140	477.529	0.184	0.151	1.11	77.3	0.95	99	5.73	0.00	95.6	306.6	86.3	85.8
141			0.150	1.03	77.3	0.95	-	5.74	0.01	95.5	304.7	86.5	85.5
142			0.151	0.93	77.2	0.95	-	5.72	-0.02	95.4	302.6	86.5	86.2
143			0.151	1.03	77.3	0.95	-	5.71	-0.01	95.5	300.6	86.6	85.6
144			0.151	0.98	77.2	0.94	-	5.68	-0.03	95.2	298.9	86.7	85.4
145			0.151	1.05	77.2	0.95	-	5.68	0.00	95.2	297.3	86.8	85.8
146			0.151	1.14	77.2	0.95	-	5.67	-0.01	95.0	294.9	86.7	85.8
147			0.151	1.02	77.2	0.95	-	5.66	-0.01	94.8	292.5	86.8	85.7
148			0.152	1.02	77.2	0.94	-	5.65	-0.01	94.5	290.4	87.0	85.2
149			0.150	0.99	77.2	0.94	-	5.64	-0.01	94.4	288.9	86.9	85.3
150	479.371	0.184	0.151	1.10	77.3	0.95	99	5.63	0.00	94.4	287.2	87.0	85.4
151			0.152	0.99	77.3	0.93	-	5.60	-0.04	94.1	285.7	86.8	85.6
152			0.151	0.79	77.3	0.94	-	5.59	-0.01	94.3	284.5	86.9	85.7
153			0.151	0.94	77.2	0.94	-	5.57	-0.02	93.7	283.4	86.8	84.7
154			0.150	0.78	77.2	0.94	-	5.57	0.00	93.4	282.0	86.8	84.5
155			0.152	0.96	77.3	0.93	-	5.56	-0.01	93.3	280.8	86.7	84.5
156			0.151	0.83	77.2	0.94	-	5.55	0.00	93.2	279.9	86.9	84.9
157			0.152	0.76	77.2	0.92	-	5.53	-0.02	92.9	278.4	86.8	84.3
158			0.152	0.76	77.2	0.95	-	5.51	-0.02	92.8	277.6	86.7	84.6
159			0.151	0.70	77.2	0.95	-	5.49	-0.02	92.7	275.8	86.7	84.6
160	481.217	0.185	0.152	0.74	77.2	0.93	99	5.49	-0.01	92.5	274.6	86.6	84.5
161			0.152	0.75	77.2	0.95	-	5.47	-0.02	92.7	273.0	86.7	84.5
162			0.152	0.75	77.2	0.96	-	5.46	-0.01	92.4	271.8	86.6	84.5
163			0.152	0.77	77.2	0.97	-	5.44	-0.01	92.4	270.4	86.6	84.7
164			0.152	0.84	77.2	0.96	-	5.43	-0.02	92.4	269.3	86.6	84.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165			0.153	0.86	77.2	0.96	-	5.42	-0.01	92.1	268.2	86.3	84.4
166			0.152	0.88	77.2	0.96	-	5.39	-0.02	92.0	267.2	86.0	84.3
167			0.153	1.03	77.2	0.96	-	5.39	0.00	91.9	265.7	85.7	84.1
168			0.154	1.02	77.2	0.95	-	5.38	-0.01	91.6	265.0	85.4	84.1
169			0.151	1.00	77.2	0.94	-	5.36	-0.02	91.7	264.5	85.1	84.1
170	483.096	0.188	0.154	1.01	77.3	0.95	100	5.35	-0.01	91.4	263.7	84.8	84.1
171			0.154	0.91	77.2	0.96	-	5.34	-0.01	91.4	263.0	84.5	83.9
172			0.151	0.87	77.3	0.96	-	5.31	-0.03	91.2	262.3	84.3	84.1
173			0.153	0.99	77.2	0.96	-	5.29	-0.02	91.3	261.5	84.1	84.2
174			0.154	1.11	77.2	0.95	-	5.29	0.00	91.3	261.0	83.9	83.8
175			0.154	0.95	77.2	0.94	-	5.27	-0.03	91.1	260.1	83.6	84.1
176			0.153	1.00	77.2	0.94	-	5.26	-0.01	90.8	259.5	83.5	83.8
177			0.152	0.94	77.2	0.94	-	5.25	-0.01	90.9	258.6	83.2	83.7
178			0.153	0.95	77.2	0.96	-	5.23	-0.03	90.9	257.8	83.1	83.8
179			0.154	1.01	77.3	0.95	-	5.21	-0.02	90.8	257.4	82.9	83.8
180	484.978	0.188	0.152	1.03	77.3	0.94	100	5.19	-0.02	90.8	256.7	82.7	83.8
181			0.153	1.03	77.2	0.96	-	5.18	-0.01	90.6	255.8	82.7	83.7
182			0.153	1.05	77.3	0.95	-	5.17	0.00	90.5	255.2	82.4	83.9
183			0.153	1.12	77.3	0.95	-	5.16	-0.02	90.2	254.6	82.3	83.9
184			0.153	1.05	77.3	0.96	-	5.13	-0.03	90.5	254.0	82.5	84.0
185			0.152	1.03	77.3	0.95	-	5.11	-0.02	90.4	253.3	82.5	84.0
186			0.152	1.00	77.3	0.95	-	5.11	0.00	90.2	252.2	82.6	84.2
187			0.152	1.06	77.3	0.96	-	5.09	-0.01	90.3	251.2	82.6	83.6
188			0.152	1.07	77.3	0.95	-	5.08	-0.02	90.0	250.4	82.8	83.6
189			0.151	0.99	77.3	0.96	-	5.06	-0.02	90.0	249.5	82.7	83.5
190	486.866	0.189	0.153	1.01	77.3	0.97	101	5.05	-0.01	90.1	248.6	82.8	83.4
191			0.151	0.91	77.3	0.97	-	5.04	-0.02	89.9	248.0	82.9	83.5
192			0.152	1.11	77.3	0.96	-	5.01	-0.03	90.1	247.5	83.0	83.4
193			0.153	1.17	77.3	0.96	-	4.99	-0.02	90.0	247.1	83.1	83.5
194			0.152	0.92	77.3	0.96	-	4.98	-0.01	89.8	246.3	83.1	83.5
195			0.152	1.11	77.3	0.96	-	4.97	-0.01	89.5	245.3	83.2	84.3
196			0.153	1.15	77.3	0.96	-	4.93	-0.04	89.1	244.6	83.0	84.7
197			0.152	1.28	77.3	0.96	-	4.91	-0.02	89.2	243.9	83.2	85.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198			0.151	1.05	77.3	0.96	-	4.88	-0.03	89.4	243.4	83.3	85.3
199			0.153	0.99	77.3	0.96	-	4.85	-0.03	89.2	243.3	83.3	85.5
200	488.750	0.188	0.152	1.02	77.3	0.95	100	4.84	-0.01	89.3	242.8	83.3	85.7
201			0.153	0.97	77.3	0.97	-	4.81	-0.03	89.2	242.2	83.3	85.6
202			0.153	0.92	77.3	0.96	-	4.79	-0.02	89.3	242.0	83.3	85.8
203			0.153	0.85	77.2	0.96	-	4.78	-0.01	89.4	241.6	83.3	85.7
204			0.153	0.93	77.3	0.96	-	4.76	-0.01	89.2	241.4	83.4	85.9
205			0.153	0.96	77.2	0.98	-	4.74	-0.02	89.3	240.9	83.4	85.7
206			0.153	0.82	77.2	0.96	-	4.73	-0.01	89.2	240.7	83.4	85.8
207			0.153	0.87	77.2	0.96	-	4.72	-0.01	89.2	240.0	83.5	85.8
208			0.153	0.79	77.2	0.96	-	4.71	-0.02	89.2	239.7	83.4	86.0
209			0.153	0.86	77.2	0.96	-	4.70	-0.01	89.1	239.4	83.3	86.1
210	490.638	0.189	0.153	0.85	77.3	0.97	100	4.69	-0.01	89.0	238.9	83.4	85.9
211			0.152	0.78	77.2	0.97	-	4.66	-0.03	89.1	238.6	83.4	86.1
212			0.153	0.81	77.2	0.97	-	4.65	-0.01	89.1	238.3	83.4	86.0
213			0.153	0.75	77.2	0.97	-	4.64	-0.01	89.0	237.9	83.5	86.0
214			0.152	0.73	77.2	0.98	-	4.61	-0.02	88.8	237.8	83.5	86.0
215			0.153	0.78	77.2	0.96	-	4.61	0.00	89.0	237.2	83.4	85.7
216			0.153	0.87	77.2	0.96	-	4.59	-0.02	88.9	236.7	83.5	86.0
217			0.154	0.67	77.2	0.98	-	4.59	-0.01	88.8	236.5	83.5	86.1
218			0.153	0.73	77.2	0.98	-	4.58	-0.01	88.8	236.2	83.5	86.1
219			0.153	0.72	77.2	0.98	-	4.57	-0.01	88.8	235.8	83.4	86.3
220	492.504	0.187	0.153	0.88	77.1	0.97	99	4.54	-0.03	88.8	235.4	83.5	86.0
221			0.152	0.83	77.2	0.99	-	4.53	-0.01	88.9	235.0	83.6	86.1
222			0.153	0.98	77.2	0.97	-	4.52	-0.01	88.9	234.4	83.6	86.2
223			0.153	0.99	77.2	0.98	-	4.51	-0.01	88.8	234.2	83.5	86.1
224			0.154	0.98	77.3	0.98	-	4.50	-0.01	88.8	233.6	83.6	86.2
225			0.152	1.01	77.3	0.97	-	4.49	-0.01	88.6	233.2	83.5	86.2
226			0.153	0.96	77.4	0.96	-	4.47	-0.02	88.6	232.8	83.5	86.2
227			0.153	1.03	77.3	0.96	-	4.45	-0.02	88.5	232.3	83.5	86.2
228			0.152	1.04	77.4	0.97	-	4.45	0.00	88.6	231.9	83.3	86.2
229			0.152	1.05	77.4	0.97	-	4.43	-0.02	88.4	231.3	83.3	86.1
230	494.374	0.187	0.152	0.93	77.4	0.97	99	4.41	-0.02	88.4	230.8	83.2	86.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231			0.153	1.00	77.4	0.96	-	4.41	0.00	88.4	230.4	83.2	86.0
232			0.151	1.09	77.4	0.97	-	4.40	-0.01	88.3	230.1	83.2	85.9
233			0.154	1.03	77.4	0.96	-	4.39	-0.01	88.2	229.5	83.3	85.9
234			0.153	1.01	77.4	0.96	-	4.39	-0.01	88.4	229.3	83.2	85.9
235			0.152	1.07	77.4	0.98	-	4.36	-0.02	88.4	228.8	83.2	85.8
236			0.152	1.04	77.4	0.98	-	4.37	0.01	88.2	228.3	83.2	86.1
237			0.153	1.05	77.4	0.96	-	4.34	-0.02	88.2	228.0	83.2	86.2
238			0.153	1.06	77.4	0.97	-	4.34	0.00	88.2	227.6	83.2	86.0
239			0.154	1.04	77.4	0.97	-	4.33	-0.01	88.2	227.0	83.2	86.0
240	496.241	0.187	0.153	1.02	77.4	0.98	99	4.32	-0.01	88.1	226.7	83.2	85.7
241			0.153	0.98	77.5	0.98	-	4.31	-0.02	88.2	226.4	83.1	86.2
242			0.153	0.93	77.5	0.99	-	4.30	0.00	88.2	226.0	83.0	85.8
243			0.154	0.65	77.5	0.99	-	4.29	-0.01	88.0	225.8	83.1	86.0
244			0.153	0.85	77.5	1.00	-	4.28	-0.01	88.0	225.3	83.2	85.8
245			0.153	0.84	77.4	0.99	-	4.26	-0.02	88.0	224.5	83.0	85.9
246			0.153	1.00	77.4	0.98	-	4.25	-0.01	88.0	224.3	83.1	86.0
247			0.154	0.78	77.4	0.98	-	4.24	-0.01	87.9	224.2	83.1	85.8
248			0.153	0.92	77.4	0.98	-	4.24	-0.01	87.8	223.8	83.1	85.6
249			0.153	0.81	77.3	0.97	-	4.23	-0.01	87.7	223.4	83.1	85.8
250	498.104	0.186	0.154	0.92	77.3	0.99	98	4.22	-0.01	87.6	222.7	83.2	85.7
251			0.154	1.01	77.3	1.00	-	4.20	-0.02	87.6	222.0	83.2	85.8
252			0.152	1.25	77.3	0.98	-	4.19	-0.01	87.6	221.3	83.1	85.9
253			0.153	1.08	77.3	0.99	-	4.19	-0.01	87.5	220.9	83.1	85.5
254			0.154	1.21	77.3	0.99	-	4.17	-0.02	87.5	220.4	83.1	85.6
255			0.154	1.26	77.3	0.98	-	4.17	0.00	87.4	219.7	83.2	85.7
256			0.153	1.25	77.2	0.98	-	4.14	-0.03	87.6	219.2	83.1	85.7
257			0.152	1.27	77.2	1.00	-	4.15	0.00	87.4	218.7	83.2	85.5
258			0.154	1.26	77.2	0.98	-	4.13	-0.02	87.4	218.2	83.2	85.6
259			0.153	1.29	77.2	0.99	-	4.12	-0.01	87.3	217.6	83.2	85.5
260	499.971	0.187	0.153	1.26	77.2	0.99	99	4.11	-0.01	87.3	217.1	83.2	85.9
261			0.154	1.27	77.2	1.00	-	4.11	0.00	87.3	216.5	83.1	85.6
262			0.153	1.26	77.2	1.03	-	4.10	-0.01	87.2	216.1	83.2	85.5
263			0.153	1.24	77.2	1.03	-	4.09	-0.02	87.2	215.8	83.1	85.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264			0.153	1.24	77.2	1.03	-	4.07	-0.01	87.2	215.5	83.1	85.7
265			0.154	1.25	77.2	1.03	-	4.06	-0.01	87.1	215.1	83.2	85.6
266			0.154	1.26	77.2	1.03	-	4.06	-0.01	87.1	214.8	83.2	85.4
267			0.152	1.24	77.2	1.03	-	4.05	0.00	87.0	214.2	83.2	85.2
268			0.153	1.25	77.2	1.03	-	4.04	-0.01	87.0	213.9	83.1	85.3
269			0.154	1.22	77.2	1.02	-	4.03	-0.01	87.0	213.6	83.1	85.6
270	501.885	0.191	0.153	1.21	77.2	1.03	101	4.02	-0.01	87.0	213.3	83.1	85.6
271			0.152	1.19	77.2	1.04	-	4.01	0.00	86.9	213.1	83.1	85.5
272			0.153	1.21	77.3	1.04	-	3.99	-0.02	86.9	212.7	83.1	85.4
273			0.153	1.19	77.3	1.05	-	3.98	-0.01	86.7	212.2	83.0	85.3
274			0.153	1.21	77.3	1.05	-	3.97	-0.01	86.5	211.9	83.0	85.4
275			0.152	1.18	77.3	1.05	-	3.95	-0.02	86.5	211.7	83.1	85.7
276			0.154	1.22	77.3	1.05	-	3.94	-0.01	86.6	211.3	83.0	85.8
277			0.153	1.24	77.2	1.05	-	3.92	-0.02	86.4	211.1	82.9	85.6
278			0.153	1.22	77.3	1.05	-	3.91	-0.01	86.4	210.9	82.9	86.0
279			0.153	1.25	77.3	1.02	-	3.91	0.00	86.5	210.8	82.9	86.0
280	503.810	0.193	0.153	1.24	77.3	1.04	102	3.89	-0.02	86.5	210.4	82.9	85.8
281			0.154	1.25	77.3	1.03	-	3.87	-0.02	86.5	210.3	82.8	85.9
282			0.153	1.27	77.3	1.05	-	3.86	-0.01	86.4	210.2	82.9	85.8
283			0.154	1.29	77.3	1.04	-	3.85	-0.01	86.3	209.9	82.9	85.7
284			0.154	1.27	77.3	1.04	-	3.83	-0.02	86.3	209.8	82.8	85.5
285			0.153	1.28	77.4	1.03	-	3.83	-0.01	86.3	209.5	82.8	85.7
286			0.153	1.28	77.3	1.05	-	3.80	-0.03	86.3	209.3	82.8	85.8
287			0.154	1.27	77.2	1.04	-	3.80	0.00	86.3	209.2	82.8	85.7
288			0.154	1.23	77.2	1.06	-	3.79	-0.01	86.3	209.1	82.8	85.7
289			0.154	1.24	77.2	1.05	-	3.78	-0.01	86.3	208.5	82.8	85.8
290	505.732	0.192	0.153	1.26	77.2	1.06	102	3.78	-0.01	86.3	208.4	82.8	86.1
291			0.154	1.25	77.2	1.06	-	3.78	0.00	85.5	207.9	82.6	85.8
292			0.154	1.24	77.2	1.05	-	3.76	-0.02	84.3	207.5	82.5	86.5
293			0.154	1.10	77.2	1.06	-	3.75	-0.01	83.9	207.3	82.4	87.1
294			0.155	1.15	77.2	1.06	-	3.74	-0.01	83.8	207.2	82.3	87.0
295			0.154	1.25	77.2	1.05	-	3.72	-0.02	83.7	207.4	82.3	87.4
296			0.154	1.02	77.2	1.05	-	3.70	-0.02	83.7	207.6	82.2	88.0



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297			0.153	1.03	77.1	1.06	-	3.70	0.00	83.7	207.6	82.3	87.9
298			0.153	1.05	77.1	1.06	-	3.68	-0.02	83.5	207.6	82.2	88.0
299			0.154	1.05	77.1	1.06	-	3.66	-0.02	83.5	207.8	82.2	88.3
300	507.640	0.191	0.154	1.08	77.1	1.06	101	3.66	0.00	83.6	208.2	82.2	88.1
301			0.153	0.81	77.1	1.03	-	3.65	-0.01	83.6	208.1	82.2	88.4
302			0.154	1.22	77.1	1.05	-	3.64	0.00	83.5	208.1	82.1	88.3
303			0.155	1.16	77.1	1.06	-	3.63	-0.01	83.4	207.8	82.2	88.8
304			0.154	1.24	77.1	1.07	-	3.62	-0.01	83.5	207.5	82.1	88.8
305			0.154	1.17	77.0	1.07	-	3.61	-0.01	83.6	207.2	82.0	88.9
306			0.154	1.22	77.0	1.07	-	3.59	-0.02	83.5	207.1	82.1	88.7
307			0.153	1.27	77.0	1.05	-	3.59	-0.01	83.5	206.9	82.1	89.0
308			0.152	1.16	77.1	1.05	-	3.58	-0.01	83.4	206.6	82.1	89.0
309			0.154	1.26	77.0	1.07	-	3.57	-0.01	83.5	206.3	82.6	89.3
310	509.539	0.190	0.153	1.25	77.0	1.07	100	3.56	-0.01	83.5	206.0	82.9	89.4
311			0.153	1.25	77.0	1.07	-	3.55	-0.01	83.7	205.8	83.0	89.4
312			0.152	1.26	77.0	1.07	-	3.54	-0.01	85.1	206.3	83.5	89.3
313			0.153	1.26	77.0	1.07	-	3.53	-0.01	85.4	206.4	83.8	88.7
314			0.153	1.22	77.1	1.08	-	3.52	-0.01	85.4	206.4	84.3	88.6
315			0.153	1.21	77.1	1.09	-	3.51	-0.01	85.4	206.3	84.4	88.3
316			0.153	1.26	77.1	1.08	-	3.50	-0.01	85.4	206.1	84.8	88.3
317			0.153	1.24	77.0	1.08	-	3.50	0.00	85.3	206.1	85.1	88.2
318			0.153	1.24	77.0	1.08	-	3.48	-0.02	85.4	206.0	85.4	88.6
319			0.153	1.23	77.0	1.07	-	3.47	0.00	85.3	205.8	85.5	88.6
320	511.426	0.189	0.153	1.20	77.0	1.08	100	3.47	-0.01	85.5	205.6	85.7	88.0
321			0.153	1.21	77.0	1.08	-	3.46	0.00	85.3	205.1	85.8	88.3
322			0.152	1.20	77.0	1.07	-	3.45	-0.01	85.4	204.9	86.0	88.3
323			0.153	1.22	77.0	1.08	-	3.44	-0.01	85.3	204.6	86.3	88.4
324			0.153	1.19	77.0	1.07	-	3.44	0.00	85.4	204.1	86.4	88.2
325			0.152	1.20	77.0	1.09	-	3.43	-0.01	85.3	203.9	86.5	88.2
326			0.154	1.20	77.0	1.08	-	3.42	-0.01	85.3	203.6	86.6	88.1
327			0.154	1.16	77.0	1.09	-	3.41	-0.01	85.3	203.0	86.8	88.3
328			0.152	1.18	77.0	1.09	-	3.41	0.00	85.4	202.7	86.9	88.2
329			0.152	1.20	77.0	1.10	-	3.40	-0.01	85.2	202.4	87.0	88.1

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	513.300	0.187	0.154	1.17	77.0	1.10	99	3.39	-0.01	85.3	202.2	86.7	88.0
331			0.154	1.18	77.0	1.10	-	3.39	-0.01	85.2	202.0	86.5	87.8
332			0.154	1.20	77.0	1.11	-	3.37	-0.01	85.1	201.8	86.2	87.7
333			0.154	1.20	77.0	1.12	-	3.36	-0.01	85.1	201.5	85.9	88.3
334			0.152	1.21	77.0	1.10	-	3.36	0.00	85.2	201.0	85.7	87.9
335			0.153	1.21	77.0	1.12	-	3.36	0.00	85.0	200.7	85.5	87.9
336			0.154	1.20	77.0	1.12	-	3.35	-0.01	85.0	200.4	85.4	88.1
337			0.154	1.21	77.0	1.11	-	3.34	0.00	85.1	200.1	85.1	87.8
338			0.153	1.22	77.0	1.12	-	3.33	-0.01	85.0	199.8	84.9	88.1
339			0.153	1.22	77.0	1.12	-	3.32	-0.01	84.9	199.5	84.8	88.0
340	515.194	0.189	0.154	1.21	77.0	1.12	100	3.32	0.00	85.0	199.2	84.6	87.9
341			0.154	1.22	77.0	1.12	-	3.31	-0.01	85.0	199.0	84.4	88.0
342			0.153	1.20	77.0	1.12	-	3.30	-0.01	84.9	199.2	84.4	87.8
343			0.154	1.19	77.0	1.10	-	3.29	-0.01	85.0	198.9	84.2	88.0
344			0.153	1.21	77.0	1.12	-	3.28	-0.01	84.9	198.6	84.1	87.9
345	516.145	0.190	0.153	1.21	77.0	1.11	100	3.28	0.00	84.9	198.4	83.8	87.9
Avg/Tot	64.257	0.186	0.151	1.08	77.3	0.94	100			94.9	332.0	84.4	85.8

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	526.605		0.24	75.5	0.60		82.2	0.081	2.70	0.048	19.2	54.5
1			0.25	75.8	0.63	-	82.4	0.069	1.52	0.062	19.2	54.5
2			0.26	75.7	0.71	-	82.6	0.073	1.85	0.173	19.2	54.5
3			0.25	75.8	0.72	-	82.9	0.083	2.53	0.201	19.2	54.5
4			0.24	75.8	0.64	-	83.3	0.098	3.47	0.233	19.2	54.5
5			0.23	75.8	0.60	-	83.6	0.090	10.20	0.816	19.2	54.5
6			0.23	75.8	0.60	-	83.8	0.092	10.48	0.493	19.2	54.5
7			0.23	75.7	0.72	-	83.9	0.089	10.55	0.472	20.9	63.3
8			0.25	75.7	0.64	-	84.1	0.089	9.82	0.398	22.1	65.3
9			0.24	75.7	0.61	-	84.4	0.090	9.88	0.312	21.6	65.7
10	528.396	0.179	0.26	75.7	0.63	103	84.5	0.088	10.29	0.339	21.8	65.3
11			0.26	75.6	0.61	-	84.6	0.088	9.92	0.253	21.8	64.6
12			0.26	75.6	0.61	-	84.5	0.087	9.53	0.211	22.1	63.9
13			0.25	75.6	0.64	-	84.4	0.086	9.37	0.219	22.4	63.1
14			0.26	75.7	0.64	-	84.5	0.086	9.40	0.208	22.7	62.8
15			0.24	75.7	0.67	-	84.4	0.085	9.31	0.155	22.9	62.2
16			0.25	75.7	0.65	-	84.5	0.085	9.33	0.171	23.0	62.1
17			0.25	75.7	0.71	-	84.5	0.086	9.35	0.123	23.0	61.9
18			0.28	75.6	0.60	-	84.4	0.085	9.38	0.123	23.2	61.9
19			0.26	75.6	0.67	-	84.4	0.085	9.61	0.091	23.3	62.1
20	530.152	0.176	0.26	75.7	0.61	99	84.4	0.085	9.76	0.077	23.4	62.1
21			0.26	75.7	0.71	-	84.3	0.085	9.90	0.060	23.4	62.1
22			0.27	75.7	0.68	-	84.2	0.085	9.97	0.057	23.4	62.1
23			0.27	75.7	0.70	-	84.1	0.086	10.01	0.048	23.4	62.1
24			0.26	75.6	0.71	-	84.0	0.086	10.19	0.038	23.4	62.2
25			0.28	75.6	0.70	-	83.9	0.087	10.39	0.042	23.4	62.2
26			0.28	75.6	0.66	-	83.8	0.085	10.55	0.040	23.3	62.4
27			0.26	75.6	0.70	-	83.8	0.087	10.75	0.033	23.3	62.4
28			0.27	75.6	0.61	-	83.8	0.086	10.82	0.039	23.3	62.4
29			0.27	75.6	0.62	-	83.7	0.087	10.80	0.029	23.3	62.4
30	531.915	0.176	0.27	75.6	0.70	99	83.7	0.087	10.85	0.028	23.4	62.2
31			0.29	75.6	0.72	-	83.7	0.088	10.91	0.037	23.5	62.4
32			0.28	75.6	0.69	-	83.5	0.087	10.96	0.035	23.5	62.2
33			0.29	75.6	0.64	-	83.4	0.087	11.07	0.045	23.6	62.2
34			0.28	75.6	0.74	-	83.4	0.088	11.18	0.054	23.6	62.2
35			0.31	75.5	0.68	-	83.3	0.088	11.17	0.067	23.5	62.2
36			0.29	75.5	0.75	-	83.2	0.088	11.22	0.083	23.4	62.4
37			0.28	75.5	0.70	-	83.2	0.088	11.23	0.074	23.4	62.2
38			0.28	75.5	0.76	-	83.2	0.087	11.28	0.087	23.4	62.4

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.27	75.5	0.72	-	83.2	0.088	11.24	0.102	23.4	62.4
40	533.662	0.175	0.27	75.5	0.74	98	83.2	0.089	11.46	0.148	23.3	62.4
41			0.28	75.5	0.82	-	83.1	0.088	11.53	0.186	23.4	62.4
42			0.29	75.5	0.83	-	83.1	0.088	11.54	0.193	23.2	62.4
43			0.28	75.5	0.87	-	83.0	0.088	11.10	0.080	22.9	61.9
44			0.29	75.5	0.88	-	82.9	0.087	10.75	0.040	23.4	61.3
45			0.30	75.5	0.83	-	82.8	0.087	10.66	0.026	24.0	61.2
46			0.29	75.5	0.80	-	82.8	0.087	10.55	0.015	24.3	60.8
47			0.32	75.5	0.80	-	82.8	0.086	10.43	0.010	24.8	60.4
48			0.29	75.5	0.80	-	82.7	0.086	10.38	0.025	25.3	60.1
49			0.33	75.5	0.88	-	82.6	0.086	10.32	0.006	25.5	59.9
50	535.446	0.178	0.32	75.5	0.83	100	82.6	0.085	10.31	0.007	25.8	59.7
51			0.30	75.5	0.84	-	82.5	0.085	10.39	0.015	25.9	59.5
52			0.31	75.5	0.83	-	82.4	0.086	10.32	0.007	26.0	59.4
53			0.32	75.5	0.81	-	82.3	0.086	10.36	0.008	26.2	59.2
54			0.32	75.5	0.81	-	82.2	0.086	10.36	0.006	26.4	58.8
55			0.32	75.5	0.83	-	82.3	0.085	10.46	0.013	26.4	58.8
56			0.30	75.5	0.85	-	82.6	0.085	10.52	0.018	26.7	58.6
57			0.31	75.5	0.84	-	82.7	0.085	10.29	0.011	26.7	58.6
58			0.31	75.5	0.88	-	82.9	0.085	10.11	0.001	26.7	58.5
59			0.31	75.5	0.90	-	83.1	0.085	10.23	(0.002)	26.9	58.5
60	537.241	0.179	0.32	75.5	0.89	100	83.3	0.084	10.21	(0.002)	26.9	58.6
61			0.32	75.5	0.88	-	83.4	0.085	10.34	(0.002)	26.9	58.6
62			0.31	75.5	0.85	-	83.6	0.085	10.39	(0.004)	27.2	58.6
63			0.31	75.5	0.87	-	83.8	0.084	10.50	(0.002)	27.1	58.6
64			0.29	75.6	0.91	-	84.1	0.084	10.23	(0.003)	26.9	58.1
65			0.29	75.7	0.87	-	84.4	0.084	9.78	(0.015)	26.8	57.7
66			0.30	75.7	0.90	-	84.5	0.083	9.58	(0.017)	25.9	57.9
67			0.30	75.8	0.87	-	84.9	0.083	9.44	(0.015)	25.3	57.9
68			0.31	75.8	0.96	-	85.1	0.083	9.31	(0.014)	24.9	57.9
69			0.30	75.9	0.89	-	85.4	0.084	9.17	(0.012)	24.7	57.7
70	539.036	0.179	0.29	75.9	0.90	99	85.6	0.082	8.87	(0.009)	24.5	57.6
71			0.31	75.9	0.99	-	85.8	0.083	8.88	(0.003)	24.3	57.6
72			0.31	75.9	0.89	-	86.0	0.083	9.23	(0.002)	24.1	57.7
73			0.32	76.0	0.99	-	85.9	0.083	9.55	(0.006)	23.9	57.9
74			0.31	76.0	0.99	-	85.8	0.083	9.80	(0.007)	23.7	57.9
75			0.30	76.0	0.90	-	85.8	0.081	9.23	0.012	23.3	57.9
76			0.31	76.1	0.97	-	85.8	0.081	8.72	0.000	22.0	57.7
77			0.32	76.0	0.89	-	85.8	0.080	8.53	(0.005)	21.4	57.4

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.31	76.0	0.94	-	85.7	0.079	8.36	(0.008)	20.8	57.0
79			0.31	76.1	0.91	-	85.7	0.078	8.25	(0.011)	20.5	56.8
80	540.850	0.181	0.33	76.1	0.98	101	85.6	0.078	8.14	(0.013)	20.3	56.7
81			0.34	76.0	0.99	-	85.5	0.078	7.88	(0.011)	20.2	56.5
82			0.32	76.0	0.99	-	85.4	0.077	7.70	(0.002)	19.9	56.3
83			0.32	76.0	0.90	-	85.2	0.077	7.55	0.000	19.8	56.1
84			0.33	76.0	0.89	-	85.1	0.076	7.47	0.002	19.8	55.9
85			0.32	76.0	1.01	-	85.1	0.076	7.45	0.004	19.8	55.9
86			0.31	75.9	0.92	-	84.9	0.076	7.27	0.007	19.7	55.8
87			0.31	75.9	0.99	-	84.8	0.075	7.20	0.004	19.6	55.8
88			0.33	75.9	0.93	-	84.6	0.074	7.00	0.024	19.6	55.6
89			0.33	75.9	0.92	-	84.7	0.073	6.56	0.066	19.6	55.0
90	542.650	0.180	0.33	75.9	0.99	100	84.5	0.073	6.15	0.101	20.1	54.5
91			0.30	75.9	0.98	-	84.4	0.071	5.89	0.132	20.4	54.1
92			0.31	75.9	0.91	-	84.4	0.071	5.76	0.143	20.6	54.0
93			0.32	75.9	0.96	-	84.2	0.070	5.37	0.178	20.9	53.8
94			0.31	75.9	0.99	-	84.1	0.068	5.18	0.226	20.7	54.0
95			0.31	75.9	0.96	-	84.1	0.068	5.04	0.289	20.4	54.0
96			0.31	75.9	0.90	-	83.9	0.067	4.82	0.378	20.3	53.8
97			0.32	75.9	0.92	-	83.8	0.064	4.77	0.391	20.7	53.4
98			0.33	75.9	0.89	-	83.7	0.064	4.44	0.491	20.7	53.4
99			0.33	75.9	0.90	-	83.6	0.064	4.40	0.477	20.8	53.4
100	544.441	0.179	0.31	76.0	0.88	99	83.5	0.063	4.18	0.486	20.8	53.4
101			0.33	76.0	0.90	-	83.4	0.062	4.14	0.491	21.0	53.2
102			0.31	76.0	0.94	-	83.3	0.062	4.10	0.493	21.2	53.1
103			0.34	75.9	0.92	-	83.1	0.061	4.08	0.479	21.1	53.2
104			0.33	75.9	0.88	-	83.0	0.061	4.07	0.472	21.2	53.2
105			0.33	75.9	0.86	-	83.0	0.060	4.05	0.466	21.2	53.2
106			0.33	75.9	0.85	-	83.0	0.059	4.05	0.465	21.3	53.1
107			0.35	75.9	0.89	-	82.8	0.059	4.05	0.461	21.4	53.1
108			0.35	75.9	0.85	-	82.7	0.058	4.05	0.459	21.5	52.9
109			0.35	75.9	0.81	-	82.7	0.058	4.06	0.459	21.7	52.9
110	546.247	0.181	0.33	75.9	0.81	100	82.7	0.058	4.05	0.458	21.9	52.9
111			0.34	75.9	0.82	-	82.7	0.058	4.07	0.457	21.9	52.9
112			0.33	75.9	0.81	-	82.5	0.058	4.06	0.458	22.0	52.9
113			0.34	75.9	0.81	-	82.5	0.057	4.09	0.462	22.2	52.7
114			0.34	75.8	0.83	-	82.4	0.057	4.09	0.462	22.5	52.7
115			0.35	75.8	0.84	-	82.3	0.057	4.05	0.459	22.6	52.7
116			0.34	75.8	0.84	-	82.3	0.057	4.05	0.461	22.6	52.5

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.35	75.8	0.90	-	82.2	0.056	4.02	0.463	22.6	52.7
118			0.33	75.8	0.88	-	82.2	0.056	4.03	0.462	22.6	52.5
119			0.35	75.8	0.82	-	82.2	0.056	4.05	0.465	22.7	52.5
120	548.043	0.180	0.35	75.8	0.84	99	82.1	0.055	4.02	0.472	22.8	52.5
121			0.36	75.8	0.84	-	82.1	0.055	3.99	0.478	22.9	52.5
122			0.37	75.8	0.86	-	82.3	0.055	4.00	0.483	22.9	52.5
123			0.36	75.8	0.91	-	82.5	0.055	4.02	0.501	23.0	52.5
124			0.36	75.8	0.97	-	82.6	0.055	4.06	0.505	23.1	52.5
125			0.38	75.9	0.96	-	82.9	0.055	4.09	0.514	23.1	52.3
126			0.36	75.9	0.97	-	83.1	0.054	4.12	0.541	23.2	52.3
127			0.36	75.9	0.90	-	83.4	0.054	4.16	0.565	23.3	52.5
128			0.34	75.8	0.92	-	83.6	0.057	4.21	0.525	23.4	52.7
129			0.35	75.9	0.91	-	83.8	0.057	4.78	0.233	23.5	52.7
130	549.843	0.180	0.36	75.9	0.98	99	84.0	0.056	4.54	0.238	23.4	52.5
131			0.36	75.9	0.95	-	84.2	0.056	4.31	0.226	23.3	52.3
132			0.34	75.9	0.90	-	84.2	0.054	4.03	0.368	23.2	52.2
133			0.36	75.8	0.88	-	84.4	0.053	3.81	0.440	23.1	51.8
134			0.35	75.8	0.87	-	84.6	0.054	3.81	0.426	23.1	51.8
135			0.34	75.8	0.87	-	84.7	0.053	3.81	0.415	23.2	51.8
136			0.33	75.9	0.89	-	85.0	0.053	3.83	0.404	23.2	51.6
137			0.34	75.9	0.87	-	85.2	0.053	3.84	0.405	23.3	51.6
138			0.34	75.9	0.92	-	85.3	0.052	3.83	0.399	23.3	51.6
139			0.31	75.9	0.94	-	85.5	0.052	3.80	0.393	23.4	51.6
140	551.640	0.180	0.34	75.8	0.89	99	85.6	0.052	3.71	0.381	23.5	51.6
141			0.32	75.9	0.87	-	85.8	0.051	3.71	0.377	23.4	51.6
142			0.31	75.8	0.95	-	85.9	0.051	3.60	0.367	23.5	51.6
143			0.35	75.9	0.90	-	85.9	0.051	3.53	0.359	23.5	51.6
144			0.34	75.8	0.96	-	86.1	0.051	3.51	0.352	23.5	51.4
145			0.32	75.8	0.88	-	86.2	0.050	3.51	0.346	23.6	51.4
146			0.35	75.9	0.96	-	86.2	0.050	3.37	0.341	23.7	51.4
147			0.32	75.9	0.86	-	86.1	0.050	3.32	0.335	23.8	51.4
148			0.32	75.9	0.87	-	86.2	0.049	3.33	0.331	23.9	51.3
149			0.32	75.9	0.90	-	86.3	0.049	3.34	0.335	24.0	51.3
150	553.440	0.180	0.32	75.9	0.89	99	86.3	0.049	3.32	0.329	24.1	51.3
151			0.32	75.9	0.93	-	86.5	0.049	3.35	0.335	24.2	51.3
152			0.32	75.9	0.86	-	86.3	0.048	3.32	0.327	24.1	51.3
153			0.33	75.9	0.95	-	86.6	0.048	3.33	0.328	24.4	51.3
154			0.32	75.9	0.86	-	86.4	0.048	3.31	0.326	24.6	51.3
155			0.33	75.9	0.85	-	86.7	0.048	3.30	0.325	24.8	51.1

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
156			0.34	75.8	0.91	-	86.7	0.047	3.31	0.325	24.7	51.1
157			0.35	75.8	0.85	-	86.7	0.047	3.27	0.322	24.9	51.1
158			0.33	75.8	0.85	-	86.8	0.047	3.24	0.324	24.9	51.1
159			0.34	75.8	0.88	-	86.7	0.047	3.17	0.321	25.1	51.1
160	555.246	0.181	0.33	75.8	0.94	98	86.9	0.047	3.10	0.323	25.2	51.1
161			0.33	75.8	0.90	-	86.9	0.046	3.10	0.319	25.1	51.1
162			0.32	75.8	0.96	-	86.8	0.046	3.10	0.316	25.3	51.1
163			0.33	75.8	0.88	-	87.0	0.045	3.08	0.313	25.3	51.1
164			0.33	75.8	0.90	-	87.0	0.046	3.04	0.311	25.3	51.1
165			0.34	75.8	0.87	-	86.7	0.046	3.07	0.321	25.5	51.1
166			0.33	75.8	0.93	-	86.4	0.045	3.07	0.317	25.6	51.1
167			0.34	75.8	0.96	-	86.2	0.046	3.08	0.312	25.6	50.9
168			0.35	75.8	0.94	-	85.9	0.045	3.08	0.309	25.8	50.9
169			0.34	75.8	0.88	-	85.7	0.045	3.08	0.309	25.8	50.9
170	557.079	0.183	0.35	75.8	0.95	99	85.4	0.045	3.06	0.304	25.9	51.1
171			0.34	75.8	0.91	-	85.2	0.045	3.07	0.305	26.0	50.9
172			0.34	75.8	0.96	-	84.9	0.045	3.06	0.304	26.2	50.9
173			0.35	75.7	0.89	-	84.5	0.045	3.05	0.302	26.1	51.1
174			0.34	75.8	0.92	-	84.4	0.045	3.05	0.301	26.1	50.9
175			0.35	75.8	0.94	-	84.3	0.044	3.01	0.297	26.2	50.9
176			0.35	75.7	0.96	-	83.9	0.044	3.01	0.299	26.3	50.9
177			0.35	75.7	0.87	-	83.7	0.044	3.00	0.297	26.4	50.9
178			0.34	75.8	0.89	-	83.5	0.044	3.00	0.298	26.3	50.9
179			0.36	75.8	0.87	-	83.3	0.044	2.98	0.295	26.4	50.9
180	558.923	0.184	0.37	75.8	0.95	100	83.0	0.044	2.99	0.298	26.4	50.9
181			0.37	75.8	0.87	-	82.8	0.044	2.99	0.300	26.5	50.9
182			0.36	75.8	0.94	-	82.7	0.044	2.99	0.302	26.6	50.7
183			0.35	75.7	0.96	-	82.7	0.043	2.98	0.303	26.7	50.7
184			0.36	75.8	0.91	-	82.6	0.044	2.91	0.319	26.6	50.9
185			0.34	75.8	0.94	-	82.6	0.043	2.86	0.312	26.6	50.7
186			0.35	75.8	0.92	-	82.8	0.043	2.82	0.307	26.8	50.7
187			0.35	75.8	0.90	-	82.8	0.042	2.83	0.304	26.8	50.7
188			0.36	75.7	0.94	-	82.9	0.043	2.82	0.302	26.9	50.7
189			0.35	75.7	0.88	-	83.1	0.042	2.81	0.298	26.9	50.7
190	560.781	0.186	0.35	75.7	0.91	101	83.1	0.042	2.82	0.299	26.9	50.7
191			0.36	75.8	0.97	-	83.2	0.042	2.81	0.298	27.0	50.7
192			0.35	75.8	0.88	-	83.3	0.042	2.81	0.298	26.9	50.7
193			0.35	75.8	0.88	-	83.5	0.042	2.81	0.297	27.0	50.7
194			0.36	75.8	0.91	-	83.5	0.042	2.82	0.300	27.1	50.7

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
195			0.35	75.8	0.92	-	83.6	0.042	2.83	0.300	27.3	50.7
196			0.35	75.8	0.88	-	83.7	0.042	2.82	0.299	27.6	50.5
197			0.35	75.8	0.96	-	83.7	0.042	2.81	0.303	27.6	50.7
198			0.36	75.8	0.97	-	83.8	0.041	2.81	0.303	27.5	50.7
199			0.36	75.8	0.97	-	83.9	0.042	2.80	0.303	27.5	50.7
200	562.642	0.186	0.36	75.8	0.88	101	84.0	0.042	2.80	0.304	27.5	50.7
201			0.36	75.8	0.95	-	84.1	0.042	2.80	0.304	27.5	50.7
202			0.37	75.8	0.97	-	84.1	0.042	2.79	0.302	27.5	50.7
203			0.38	75.8	0.87	-	84.2	0.041	2.79	0.303	27.5	50.7
204			0.38	75.8	0.91	-	84.3	0.042	2.78	0.301	27.5	50.7
205			0.38	75.8	0.91	-	84.4	0.041	2.78	0.301	27.5	50.7
206			0.38	75.8	0.88	-	84.4	0.042	2.76	0.299	27.5	50.7
207			0.38	75.8	0.97	-	84.6	0.041	2.76	0.300	27.6	50.7
208			0.36	75.8	0.97	-	84.6	0.041	2.76	0.299	27.6	50.7
209			0.37	75.7	0.97	-	84.6	0.040	2.75	0.299	27.7	50.7
210	564.509	0.187	0.36	75.8	0.93	101	84.7	0.041	2.74	0.299	27.7	50.7
211			0.37	75.8	0.97	-	84.6	0.040	2.72	0.298	27.7	50.7
212			0.35	75.8	0.88	-	84.8	0.040	2.73	0.298	27.7	50.7
213			0.37	75.8	0.89	-	84.7	0.041	2.74	0.299	27.7	50.7
214			0.36	75.8	0.97	-	84.8	0.041	2.73	0.298	27.8	50.7
215			0.35	75.8	0.96	-	84.9	0.041	2.71	0.294	27.8	50.7
216			0.37	75.8	0.92	-	84.8	0.041	2.71	0.297	27.8	50.7
217			0.35	75.8	0.97	-	84.9	0.040	2.70	0.295	27.9	50.7
218			0.38	75.8	0.95	-	85.0	0.040	2.68	0.294	27.9	50.7
219			0.38	75.8	0.98	-	85.0	0.040	2.67	0.293	27.9	50.7
220	566.345	0.184	0.38	75.8	0.93	99	85.0	0.040	2.65	0.292	27.9	50.7
221			0.36	75.8	0.88	-	84.9	0.040	2.67	0.296	27.9	50.7
222			0.37	75.7	0.97	-	84.9	0.040	2.66	0.295	27.9	50.7
223			0.38	75.7	0.89	-	85.1	0.040	2.65	0.292	27.9	50.7
224			0.38	75.8	0.92	-	85.0	0.039	2.63	0.292	28.0	50.7
225			0.38	75.8	0.94	-	85.0	0.040	2.61	0.292	28.1	50.7
226			0.38	75.8	0.89	-	85.2	0.040	2.60	0.293	28.2	50.7
227			0.37	75.8	0.95	-	85.1	0.040	2.58	0.290	28.2	50.7
228			0.37	75.8	0.95	-	85.1	0.040	2.57	0.289	28.1	50.7
229			0.38	75.9	0.95	-	85.1	0.040	2.56	0.288	28.3	50.7
230	568.189	0.184	0.40	75.9	0.98	100	85.2	0.039	2.53	0.293	28.3	50.7
231			0.38	75.9	0.98	-	85.3	0.040	2.51	0.292	28.2	50.7
232			0.38	75.9	0.89	-	85.2	0.039	2.52	0.294	28.3	50.7
233			0.38	75.9	0.96	-	85.2	0.039	2.52	0.292	28.4	50.7



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
234			0.37	75.9	0.98	-	85.2	0.039	2.51	0.291	28.3	50.7
235			0.36	75.9	0.89	-	85.1	0.039	2.50	0.290	28.3	50.7
236			0.35	75.9	0.89	-	85.2	0.039	2.49	0.290	28.4	50.7
237			0.35	75.9	0.98	-	85.1	0.039	2.49	0.290	28.4	50.7
238			0.35	75.9	0.95	-	85.2	0.038	2.49	0.292	28.4	50.7
239			0.36	75.9	0.93	-	85.1	0.038	2.49	0.291	28.5	50.7
240	570.024	0.184	0.36	75.9	0.90	99	85.2	0.039	2.48	0.291	28.5	50.7
241			0.37	76.0	0.91	-	85.2	0.038	2.48	0.291	28.6	50.7
242			0.37	75.9	0.91	-	85.1	0.038	2.48	0.292	28.6	50.7
243			0.36	76.0	0.94	-	85.2	0.039	2.46	0.291	28.7	50.7
244			0.37	76.0	0.98	-	85.3	0.038	2.45	0.289	28.7	50.7
245			0.36	75.9	0.99	-	85.2	0.039	2.43	0.290	28.7	50.7
246			0.35	75.9	0.93	-	85.2	0.038	2.44	0.293	28.7	50.7
247			0.36	75.9	0.96	-	85.1	0.038	2.43	0.290	28.7	50.7
248			0.37	75.9	0.94	-	85.2	0.038	2.43	0.290	28.8	50.7
249			0.37	75.8	0.89	-	85.2	0.038	2.44	0.292	28.8	50.5
250	571.862	0.184	0.36	75.8	0.89	99	85.1	0.038	2.43	0.292	28.8	50.5
251			0.36	75.8	0.96	-	85.0	0.038	2.38	0.286	28.8	50.5
252			0.36	75.8	0.89	-	85.1	0.037	2.33	0.284	28.9	50.5
253			0.36	75.9	0.99	-	85.1	0.038	2.34	0.285	28.9	50.5
254			0.39	75.8	0.90	-	85.0	0.038	2.33	0.283	28.9	50.5
255			0.35	75.8	0.99	-	85.1	0.038	2.33	0.282	28.9	50.5
256			0.35	75.8	0.91	-	85.1	0.037	2.32	0.279	28.9	50.5
257			0.35	75.8	0.90	-	85.1	0.037	2.31	0.280	29.0	50.5
258			0.35	75.8	0.91	-	85.0	0.037	2.31	0.281	29.0	50.5
259			0.36	75.8	1.00	-	85.1	0.037	2.30	0.279	29.0	50.5
260	573.693	0.183	0.36	75.8	0.92	99	85.1	0.037	2.29	0.280	29.0	50.5
261			0.36	75.8	0.97	-	85.1	0.037	2.29	0.283	29.1	50.5
262			0.36	75.8	1.02	-	85.0	0.036	2.28	0.282	29.1	50.5
263			0.36	75.8	0.96	-	85.1	0.036	2.28	0.283	29.1	50.5
264			0.36	75.8	1.03	-	85.1	0.036	2.27	0.282	29.2	50.4
265			0.35	75.8	0.96	-	85.0	0.036	2.30	0.291	29.2	50.5
266			0.36	75.8	0.97	-	85.1	0.037	2.30	0.291	29.2	50.5
267			0.37	75.8	1.04	-	85.1	0.036	2.28	0.288	29.2	50.4
268			0.36	75.8	0.97	-	85.0	0.036	2.28	0.287	29.3	50.4
269			0.35	75.8	0.94	-	85.1	0.036	2.29	0.289	29.3	50.4
270	575.579	0.189	0.37	75.8	1.01	102	85.0	0.036	2.30	0.295	29.3	50.4
271			0.36	75.8	0.94	-	85.0	0.036	2.30	0.295	29.3	50.4
272			0.35	75.9	0.98	-	85.0	0.036	2.30	0.296	29.4	50.4

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
273			0.34	75.9	1.00	-	84.9	0.036	2.31	0.297	29.5	50.4
274			0.35	75.9	0.96	-	85.0	0.035	2.32	0.298	29.7	50.4
275			0.34	75.9	1.00	-	85.0	0.036	2.31	0.298	29.7	50.4
276			0.34	75.9	1.04	-	85.0	0.036	2.31	0.298	29.7	50.4
277			0.36	75.8	1.05	-	85.0	0.036	2.33	0.300	29.7	50.4
278			0.36	75.9	0.99	-	85.0	0.036	2.32	0.299	29.7	50.4
279			0.35	75.9	0.95	-	84.8	0.036	2.33	0.300	29.7	50.4
280	577.470	0.189	0.38	75.9	1.03	102	84.9	0.036	2.32	0.300	29.7	50.4
281			0.34	75.9	1.02	-	84.8	0.036	2.33	0.302	29.7	50.4
282			0.34	75.9	1.05	-	84.9	0.036	2.34	0.306	29.7	50.4
283			0.34	75.9	1.01	-	84.9	0.035	2.34	0.306	29.8	50.4
284			0.35	75.9	0.96	-	84.8	0.035	2.33	0.304	29.8	50.4
285			0.34	75.9	1.05	-	84.8	0.036	2.32	0.303	29.8	50.4
286			0.34	75.9	0.99	-	84.8	0.035	2.32	0.304	29.8	50.4
287			0.33	75.9	0.98	-	84.8	0.036	2.32	0.308	29.8	50.4
288			0.33	75.9	1.05	-	84.7	0.035	2.32	0.309	29.8	50.4
289			0.32	75.8	0.98	-	84.7	0.036	2.31	0.307	29.8	50.4
290	579.360	0.189	0.34	75.8	1.03	102	84.7	0.035	2.31	0.306	29.8	50.4
291			0.31	75.8	1.03	-	84.7	0.035	2.34	0.307	30.0	50.2
292			0.34	75.8	1.05	-	84.7	0.035	2.44	0.333	31.3	50.0
293			0.33	75.8	0.97	-	84.6	0.035	2.44	0.340	31.7	50.0
294			0.34	75.8	0.97	-	84.6	0.035	2.46	0.343	31.9	50.0
295			0.33	75.8	1.00	-	84.5	0.035	2.45	0.343	31.9	50.0
296			0.33	75.8	1.02	-	84.5	0.035	2.47	0.348	31.9	50.0
297			0.32	75.8	0.99	-	84.5	0.036	2.47	0.351	31.9	50.0
298			0.34	75.7	0.99	-	84.5	0.035	2.48	0.353	32.0	49.8
299			0.32	75.7	1.03	-	84.4	0.035	2.47	0.345	32.0	50.0
300	581.241	0.188	0.32	75.7	1.03	101	84.3	0.035	2.47	0.342	31.9	50.0
301			0.32	75.7	1.07	-	84.4	0.035	2.46	0.338	32.0	50.0
302			0.34	75.7	1.01	-	84.4	0.035	2.39	0.333	32.0	49.8
303			0.31	75.7	1.00	-	84.2	0.035	2.36	0.328	32.1	49.8
304			0.31	75.7	0.98	-	84.2	0.035	2.35	0.322	32.0	49.8
305			0.33	75.7	1.03	-	84.1	0.035	2.34	0.324	32.0	49.8
306			0.33	75.7	1.01	-	84.2	0.035	2.35	0.320	32.0	49.8
307			0.34	75.7	0.98	-	84.1	0.035	2.33	0.317	32.0	49.8
308			0.31	75.7	1.04	-	84.3	0.035	2.32	0.313	32.0	49.8
309			0.32	75.7	1.05	-	84.3	0.035	2.31	0.312	32.0	49.8
310	583.123	0.188	0.33	75.7	1.05	101	84.5	0.035	2.31	0.311	31.9	49.8
311			0.32	75.7	1.06	-	84.7	0.035	2.31	0.310	32.0	49.8

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
312			0.33	75.7	0.98	-	84.7	0.036	2.27	0.304	30.7	50.0
313			0.31	75.7	0.99	-	85.0	0.035	2.26	0.305	30.5	50.0
314			0.31	75.7	1.05	-	85.1	0.035	2.26	0.306	30.4	50.0
315			0.33	75.7	0.98	-	85.2	0.035	2.27	0.307	30.4	50.0
316			0.33	75.7	0.99	-	85.3	0.035	2.25	0.305	30.3	50.0
317			0.33	75.7	1.06	-	85.4	0.035	2.24	0.302	30.3	50.0
318			0.33	75.7	1.07	-	85.6	0.035	2.24	0.303	30.3	50.0
319			0.33	75.6	1.05	-	85.8	0.035	2.24	0.302	30.3	50.0
320	584.992	0.187	0.33	75.7	1.00	101	85.9	0.034	2.21	0.300	30.3	50.0
321			0.34	75.7	1.01	-	86.0	0.034	2.18	0.296	30.3	50.0
322			0.34	75.7	1.00	-	86.1	0.034	2.17	0.292	30.3	50.0
323			0.31	75.7	1.04	-	86.2	0.034	2.16	0.290	30.3	50.0
324			0.32	75.7	1.07	-	86.3	0.034	2.16	0.287	30.3	50.0
325			0.32	75.7	1.04	-	86.5	0.034	2.16	0.287	30.3	49.8
326			0.31	75.7	1.00	-	86.6	0.034	2.15	0.285	30.3	49.8
327			0.31	75.7	1.09	-	86.7	0.034	2.14	0.282	30.4	49.8
328			0.32	75.7	1.01	-	86.6	0.034	2.13	0.281	30.3	50.0
329			0.32	75.7	1.01	-	86.9	0.034	2.13	0.279	30.3	49.8
330	586.856	0.186	0.32	75.7	1.03	100	86.7	0.034	2.12	0.276	30.4	49.8
331			0.32	75.7	1.10	-	86.6	0.034	2.12	0.276	30.4	49.8
332			0.31	75.7	1.04	-	86.5	0.034	2.11	0.274	30.4	49.8
333			0.29	75.7	1.09	-	86.5	0.034	2.11	0.274	30.5	49.8
334			0.30	75.7	1.02	-	86.3	0.034	2.11	0.273	30.4	49.8
335			0.33	75.7	1.09	-	86.2	0.034	2.08	0.273	30.5	49.8
336			0.32	75.7	1.08	-	86.1	0.034	2.07	0.270	30.5	49.8
337			0.33	75.7	1.01	-	86.1	0.034	2.07	0.269	30.5	49.8
338			0.33	75.7	1.06	-	86.1	0.034	2.07	0.269	30.5	49.8
339			0.34	75.7	1.07	-	86.0	0.033	2.06	0.266	30.5	49.8
340	588.716	0.186	0.33	75.7	1.01	100	86.0	0.034	2.06	0.273	30.6	49.8
341			0.36	75.7	1.01	-	85.8	0.033	2.09	0.285	30.6	49.8
342			0.34	75.7	1.02	-	85.7	0.033	2.10	0.292	30.5	49.8
343			0.37	75.7	1.10	-	85.6	0.033	2.10	0.291	30.5	49.8
344			0.37	75.7	1.10	-	85.6	0.034	2.12	0.289	30.6	49.8
345	589.651	0.187	0.34	75.7		101	85.6	0.033	2.11	0.284	30.6	49.8
Avg/Tot	63.046	0.183	0.33	75.8	0.91	100	84.5	0.054	4.61	0.260	26.13	53.238

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 4

Technician: SJB

Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data						
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	210.463		0.40	76.5	1.00		82.9
1			0.40	76.6	1.00	-	83.4
2			0.40	76.6	1.00	-	82.9
3			0.40	76.6	1.00	-	82.5
4			0.40	76.6	1.00	-	82.5
5			0.40	76.6	1.00	-	82.4
6			0.40	76.6	1.00	-	82.5
7			0.40	76.6	1.00	-	82.5
8			0.40	76.6	1.00	-	83.7
9			0.40	76.6	1.00	-	85.2
10	211.765	0.130	0.40	76.6	1.00	107	85.5
11			0.40	76.6	1.00	-	85.0
12			0.40	76.6	1.00	-	84.7
13			0.40	76.6	1.00	-	84.6
14			0.40	76.6	1.00	-	84.4
15			0.40	76.6	1.00	-	84.3
16			0.40	76.7	1.00	-	84.2
17			0.40	76.7	1.00	-	84.1
18			0.40	76.7	1.00	-	84.1
19			0.40	76.6	1.00	-	84.0
20	213.036	0.127	0.40	76.7	1.00	103	83.9
21			0.40	76.7	1.00	-	83.8
22			0.40	76.7	1.00	-	83.8
23			0.40	76.8	1.00	-	83.7
24			0.40	76.7	1.00	-	83.6
25			0.40	76.7	1.00	-	83.5
26			0.40	76.7	1.00	-	83.4
27			0.40	76.7	1.00	-	83.3
28			0.40	76.8	1.00	-	83.2
29			0.40	76.8	1.00	-	83.1
30	214.294	0.126	0.40	76.8	1.00	101	83.0
31			0.40	76.9	1.00	-	83.0

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 4

Technician: SJB

Date: 6/7/2023

Elapsed Time (min)	Particulate Sampling Data						
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.40	76.9	1.00	-	82.9
33			0.40	76.9	1.00	-	82.9
34			0.40	76.9	1.00	-	82.8
35			0.40	76.9	1.00	-	82.8
36			0.40	76.9	1.00	-	82.7
37			0.40	76.9	1.00	-	82.8
38			0.40	76.9	1.00	-	82.7
39			0.40	76.9	1.00	-	82.7
40	215.568	0.127	0.40	76.9	1.00	103	82.6
41			0.40	77.0	1.00	-	82.6
42			0.40	77.0	1.00	-	82.5
43			0.40	77.0	1.00	-	82.5
44			0.40	77.0	1.00	-	82.5
45			0.40	77.0	1.00	-	82.5
46			0.40	77.0	1.00	-	82.5
47			0.40	77.0	1.00	-	82.5
48			0.40	77.0	1.00	-	82.4
49			0.40	77.0	1.00	-	82.3
50	216.823	0.126	0.40	77.1	1.00	100	82.3
51			0.40	77.1	1.00	-	82.2
52			0.40	77.1	1.00	-	82.1
53			0.40	77.2	1.00	-	82.1
54			0.40	77.1	1.00	-	82.0
55			0.40	77.2	1.00	-	82.3
56			0.40	77.2	1.00	-	82.6
57			0.40	77.2	1.00	-	83.0
58			0.40	77.2	1.00	-	83.4
59			0.40	77.1	1.00	-	83.7
60	218.130	0.131	0.40	77.2	1.00	104	84.1
Avg/Tot	7.667	0.128	0.40	76.8	1.00	103	83.2

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-161Model: 1.7RTracking #: 135Run #: 4Technician: SJBDate: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	600.8	370.5	500.9	416.7	422.1	462.2	N/A
1	571.3	372.0	503.9	418.4	421.6	457.5	N/A
2	548.5	373.1	504.6	418.8	420.8	453.2	N/A
3	542.1	374.2	501.2	418.5	420.4	451.3	N/A
4	552.6	375.6	495.9	417.8	418.4	452.1	N/A
5	587.0	375.5	489.1	416.2	416.9	456.9	N/A
6	622.8	376.4	479.9	415.0	415.3	461.9	N/A
7	649.1	376.0	470.7	413.8	412.6	464.4	N/A
8	668.2	375.7	461.7	412.5	409.9	465.6	N/A
9	682.6	374.5	453.5	410.4	407.3	465.7	N/A
10	696.2	373.6	446.0	408.7	404.5	465.8	N/A
11	705.1	372.6	439.0	406.9	401.8	465.1	N/A
12	711.8	370.9	432.6	404.5	399.1	463.8	N/A
13	713.1	369.6	426.8	402.4	396.7	461.7	N/A
14	714.8	368.3	421.4	400.7	394.5	459.9	N/A
15	714.2	366.8	416.3	398.8	392.1	457.6	N/A
16	715.3	365.6	411.6	397.0	389.9	455.9	N/A
17	715.4	364.0	407.1	395.4	387.7	453.9	N/A
18	715.5	362.6	402.9	393.4	385.4	452.0	N/A
19	717.2	361.3	399.3	391.9	383.1	450.6	N/A
20	719.7	359.9	396.0	390.1	380.9	449.3	N/A
21	722.7	358.2	393.0	388.5	379.0	448.3	N/A
22	726.4	357.1	390.3	387.0	377.2	447.6	N/A
23	729.7	355.6	387.8	385.6	375.3	446.8	N/A
24	734.8	354.3	385.7	384.4	373.7	446.6	N/A
25	740.1	352.6	383.7	383.0	372.1	446.3	N/A
26	745.8	351.2	381.9	382.0	370.6	446.3	N/A
27	753.2	349.8	380.3	381.0	369.2	446.7	N/A
28	760.4	348.4	379.0	380.0	367.7	447.1	N/A
29	766.7	346.9	377.8	379.1	366.6	447.4	N/A
30	770.6	345.4	376.7	378.5	365.4	447.3	N/A
31	773.3	344.2	375.8	377.4	364.3	447.0	N/A
32	776.5	342.7	375.1	376.6	363.3	446.8	N/A
33	777.7	341.3	374.4	376.7	362.6	446.5	N/A
34	780.3	339.9	373.9	376.4	362.1	446.5	N/A
35	783.4	338.3	373.5	376.0	361.6	446.5	N/A
36	788.3	335.9	373.2	374.4	359.5	446.2	N/A
37	790.4	334.4	373.0	374.0	358.5	446.1	N/A
38	793.0	332.9	373.1	373.7	357.7	446.1	N/A
39	794.0	331.5	373.5	373.6	357.6	446.0	N/A
40	796.9	330.2	373.8	373.3	357.4	446.3	N/A
41	798.7	328.8	374.2	373.7	357.5	446.6	N/A
42	801.7	327.7	374.8	374.0	357.7	447.2	N/A
43	800.9	326.4	375.7	374.0	357.8	447.0	N/A
44	796.6	325.1	376.8	374.0	358.7	446.2	N/A
45	795.3	324.2	377.9	374.3	359.5	446.2	N/A
46	790.1	322.9	379.0	374.1	360.7	445.3	N/A
47	789.0	321.7	380.1	374.6	361.0	445.3	N/A

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
48	783.5	320.8	381.0	375.4	362.2	444.6	N/A	
49	782.3	319.4	382.3	375.1	362.8	444.4	N/A	
50	781.7	318.3	383.2	376.0	364.1	444.6	N/A	
51	781.3	317.4	384.1	376.6	364.8	444.8	N/A	
52	779.2	316.2	385.1	377.4	366.0	444.8	N/A	
53	779.7	315.3	386.3	378.1	366.9	445.3	N/A	
54	778.6	314.4	387.3	378.9	367.9	445.4	N/A	
55	777.9	313.5	388.4	380.0	368.8	445.7	N/A	
56	777.5	312.9	389.4	380.8	370.0	446.1	N/A	
57	778.4	312.1	390.6	381.7	371.0	446.7	N/A	
58	779.3	311.4	391.8	382.5	371.8	447.4	N/A	
59	780.9	310.7	393.0	383.0	372.9	448.1	N/A	
60	781.9	310.4	394.3	383.8	373.8	448.8	N/A	
61	782.4	309.5	395.6	384.7	374.8	449.4	N/A	
62	783.6	308.7	396.9	385.1	375.8	450.0	N/A	
63	783.8	308.1	398.6	385.7	377.0	450.6	N/A	
64	785.2	307.9	400.1	386.4	378.2	451.6	N/A	
65	784.8	307.4	401.8	387.1	379.0	452.0	N/A	
66	781.2	307.2	403.4	387.4	379.8	451.8	N/A	
67	780.9	306.9	404.9	387.8	380.9	452.3	N/A	
68	781.2	306.6	406.4	388.3	381.8	452.9	N/A	
69	778.3	306.5	407.9	388.7	382.7	452.8	N/A	
70	778.1	306.2	409.1	389.3	383.2	453.2	N/A	
71	774.3	306.6	410.3	390.4	384.4	453.2	N/A	
72	770.0	307.0	411.7	392.3	386.2	453.4	N/A	
73	768.1	307.1	413.0	393.4	387.4	453.8	N/A	
74	767.6	307.3	414.3	394.3	388.6	454.4	N/A	
75	767.2	307.4	415.6	395.1	389.6	455.0	N/A	
76	761.9	307.7	416.9	396.6	390.4	454.7	N/A	
77	755.5	308.4	418.1	397.7	390.9	454.1	N/A	
78	750.1	309.1	419.2	398.7	391.7	453.8	N/A	
79	743.9	309.8	420.3	399.6	392.3	453.2	N/A	
80	736.7	310.9	421.0	399.9	393.1	452.3	N/A	
81	727.2	311.5	421.7	400.4	393.4	450.8	N/A	
82	719.9	312.4	422.2	400.8	394.1	449.9	N/A	
83	714.0	313.5	422.5	400.8	394.3	449.0	N/A	
84	705.8	314.4	422.7	400.5	394.6	447.6	N/A	
85	697.6	315.3	422.8	400.7	395.0	446.3	N/A	
86	691.4	316.3	422.8	400.4	394.6	445.1	N/A	
87	687.2	317.2	422.6	400.3	394.5	444.4	N/A	
88	681.7	318.1	422.4	400.0	394.6	443.4	N/A	
89	674.1	319.2	422.2	399.4	394.2	441.8	N/A	
90	666.7	319.2	421.6	398.5	394.3	440.1	N/A	
91	657.3	320.4	420.7	397.7	393.9	438.0	N/A	
92	646.6	320.7	419.7	396.7	393.6	435.5	N/A	
93	637.2	321.2	418.6	395.9	393.1	433.2	N/A	
94	627.7	321.2	417.0	394.8	392.6	430.7	N/A	
95	618.7	321.5	415.4	394.2	392.0	428.4	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-161Model: 1.7RTracking #: 135Run #: 4Technician: SJBDate: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
96	609.7	322.2	413.8	393.2	391.4	426.1	N/A	
97	597.0	322.7	412.4	392.5	390.7	423.1	N/A	
98	585.8	323.1	410.9	391.0	389.6	420.1	N/A	
99	573.5	323.3	409.5	390.0	388.5	417.0	N/A	
100	562.3	323.7	407.9	389.1	387.4	414.1	N/A	
101	552.3	324.0	406.4	387.9	386.2	411.3	N/A	
102	542.4	324.4	404.7	386.5	384.9	408.6	N/A	
103	532.1	324.7	403.1	385.3	383.2	405.7	N/A	
104	523.4	324.8	401.5	383.7	381.7	403.0	N/A	
105	515.0	324.8	399.8	382.2	380.2	400.4	N/A	
106	507.4	324.3	398.2	380.5	378.1	397.7	N/A	
107	500.4	324.2	396.6	378.7	376.5	395.3	N/A	
108	493.5	323.8	395.1	377.1	374.6	392.8	N/A	
109	487.6	323.5	393.5	375.5	373.3	390.7	N/A	
110	481.6	323.4	392.1	374.3	371.8	388.6	N/A	
111	476.6	323.0	390.7	372.6	370.3	386.6	N/A	
112	471.5	322.6	389.3	371.1	368.5	384.6	N/A	
113	466.8	322.3	387.9	369.1	367.1	382.6	N/A	
114	462.4	321.6	386.6	368.0	365.6	380.8	N/A	
115	458.2	321.6	385.3	366.6	364.3	379.2	N/A	
116	454.2	321.1	384.1	365.3	362.9	377.5	N/A	
117	450.6	320.8	382.7	363.7	361.5	375.9	N/A	
118	446.9	320.3	381.6	362.2	360.0	374.2	N/A	
119	443.5	319.8	380.4	361.0	358.7	372.7	N/A	
120	440.2	319.2	379.3	359.7	357.2	371.1	N/A	
121	437.4	318.9	378.3	358.1	355.9	369.7	N/A	
122	434.2	318.3	377.1	356.9	354.7	368.2	N/A	
123	431.4	317.9	376.1	355.4	353.4	366.8	N/A	
124	428.6	317.2	375.0	354.6	352.5	365.6	N/A	
125	426.4	316.5	374.0	353.4	351.4	364.3	N/A	
126	424.0	316.1	373.0	352.3	350.1	363.1	N/A	
127	422.1	315.5	372.2	351.1	349.1	362.0	N/A	
128	420.9	314.9	371.3	350.1	347.8	361.0	N/A	
129	421.6	314.4	370.6	349.1	346.8	360.5	N/A	
130	422.5	313.9	369.7	348.0	345.8	360.0	N/A	
131	422.6	313.3	368.6	347.1	344.8	359.3	N/A	
132	421.6	312.7	367.3	346.2	343.9	358.3	N/A	
133	419.5	312.1	366.3	345.5	343.0	357.3	N/A	
134	417.2	311.7	365.3	344.7	341.9	356.2	N/A	
135	414.6	311.0	364.5	344.3	341.0	355.1	N/A	
136	412.3	310.4	363.7	343.5	340.2	354.0	N/A	
137	409.9	309.8	363.2	343.0	339.0	353.0	N/A	
138	407.9	309.1	362.7	342.3	338.4	352.1	N/A	
139	405.6	308.3	362.2	341.5	337.5	351.0	N/A	
140	403.6	307.6	361.5	340.6	336.7	350.0	N/A	
141	401.4	307.2	360.8	339.7	335.9	349.0	N/A	
142	398.4	306.4	360.2	338.7	335.3	347.8	N/A	
143	397.2	305.7	359.6	338.3	334.8	347.1	N/A	



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
144	394.7	305.1	359.0	338.2	334.5	346.3	N/A
145	391.9	304.5	358.3	337.5	334.0	345.2	N/A
146	390.3	304.0	357.7	336.8	333.6	344.5	N/A
147	387.0	303.5	356.9	335.9	332.6	343.2	N/A
148	385.0	302.9	356.1	334.7	331.5	342.0	N/A
149	382.3	302.2	355.3	333.6	330.4	340.8	N/A
150	380.2	301.3	354.5	333.0	329.8	339.8	N/A
151	378.2	300.3	353.7	332.2	329.1	338.7	N/A
152	376.0	300.2	352.9	331.3	328.5	337.8	N/A
153	373.6	299.5	352.3	330.3	327.0	336.5	N/A
154	371.5	298.8	351.6	329.2	325.9	335.4	N/A
155	369.7	298.0	350.8	328.2	325.2	334.4	N/A
156	367.9	297.1	350.1	327.6	324.1	333.4	N/A
157	366.1	296.4	349.4	326.6	323.6	332.4	N/A
158	364.8	295.8	348.7	326.0	323.0	331.7	N/A
159	363.0	295.0	348.0	325.3	322.5	330.8	N/A
160	361.4	294.4	347.3	324.5	321.3	329.8	N/A
161	358.8	293.6	346.8	323.7	320.5	328.7	N/A
162	357.4	292.8	346.1	322.7	319.8	327.8	N/A
163	356.2	292.3	345.6	322.0	319.2	327.0	N/A
164	354.2	291.8	344.8	321.4	318.4	326.1	N/A
165	352.4	291.1	344.1	320.1	317.6	325.1	N/A
166	351.1	290.2	343.4	319.5	316.8	324.2	N/A
167	349.2	289.9	342.6	318.7	315.9	323.3	N/A
168	347.3	289.2	341.8	317.8	314.6	322.2	N/A
169	346.1	288.8	340.9	317.1	313.6	321.3	N/A
170	344.4	288.0	340.2	316.5	312.8	320.4	N/A
171	342.7	287.5	339.4	316.0	311.7	319.4	N/A
172	341.9	286.6	338.6	315.4	310.5	318.6	N/A
173	341.2	286.0	337.8	315.3	310.0	318.1	N/A
174	340.1	285.7	337.3	315.2	309.2	317.5	N/A
175	337.9	285.3	336.7	315.2	307.8	316.6	N/A
176	336.7	284.8	336.1	314.8	306.7	315.8	N/A
177	335.5	284.1	335.4	314.5	306.3	315.1	N/A
178	334.8	283.4	334.9	314.2	305.5	314.6	N/A
179	333.2	282.8	334.4	314.5	304.7	313.9	N/A
180	332.8	282.4	333.9	314.2	303.9	313.4	N/A
181	331.4	281.7	333.4	314.0	302.9	312.7	N/A
182	330.0	281.3	332.9	314.1	301.6	312.0	N/A
183	329.1	280.7	332.2	313.7	300.7	311.3	N/A
184	328.9	280.0	331.6	313.4	300.1	310.8	N/A
185	327.7	279.4	331.1	313.4	299.4	310.2	N/A
186	326.2	278.8	330.6	313.0	298.8	309.5	N/A
187	324.7	278.5	330.1	312.8	297.7	308.7	N/A
188	324.1	277.8	329.6	312.5	297.1	308.2	N/A
189	322.8	277.2	329.1	311.9	296.1	307.4	N/A
190	321.5	276.9	328.3	311.3	295.4	306.7	N/A
191	320.8	276.1	327.7	310.7	294.6	306.0	N/A

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
192	319.9	275.6	327.2	310.2	294.3	305.4	N/A	
193	318.9	274.8	326.6	309.4	293.6	304.7	N/A	
194	317.5	274.7	325.9	308.6	293.0	303.9	N/A	
195	317.0	274.1	325.4	307.6	292.5	303.3	N/A	
196	316.0	273.5	324.9	307.2	291.6	302.6	N/A	
197	315.1	273.2	324.4	306.4	290.9	302.0	N/A	
198	314.6	272.6	323.8	305.8	290.3	301.4	N/A	
199	313.7	272.3	323.3	304.9	289.7	300.8	N/A	
200	313.0	271.7	322.8	304.2	288.9	300.1	N/A	
201	312.4	271.5	322.4	303.6	288.4	299.7	N/A	
202	311.3	270.9	322.0	303.0	287.8	299.0	N/A	
203	310.8	270.5	321.5	302.0	287.2	298.4	N/A	
204	310.3	270.0	321.1	301.3	286.7	297.9	N/A	
205	309.6	269.7	320.6	300.5	286.0	297.3	N/A	
206	308.8	269.4	320.2	299.8	285.5	296.7	N/A	
207	308.6	268.9	319.8	298.8	284.8	296.2	N/A	
208	307.6	268.5	319.3	298.1	284.4	295.6	N/A	
209	307.1	268.0	319.0	297.4	283.7	295.0	N/A	
210	306.5	267.6	318.5	296.4	283.4	294.5	N/A	
211	305.8	267.2	318.0	295.7	282.9	293.9	N/A	
212	305.1	266.7	317.6	295.1	282.4	293.4	N/A	
213	304.6	266.4	317.2	294.3	282.2	292.9	N/A	
214	304.0	266.0	316.7	293.6	281.6	292.4	N/A	
215	303.4	265.5	316.2	292.8	281.1	291.8	N/A	
216	302.8	265.2	315.8	292.2	280.6	291.3	N/A	
217	302.4	264.9	315.4	291.4	280.1	290.8	N/A	
218	301.8	264.4	314.9	290.7	279.5	290.3	N/A	
219	301.4	264.0	314.3	290.0	279.2	289.8	N/A	
220	300.5	263.6	313.7	289.3	278.7	289.2	N/A	
221	300.1	263.2	313.2	288.6	278.4	288.7	N/A	
222	299.4	262.9	312.6	288.1	277.8	288.2	N/A	
223	299.1	262.5	312.0	287.3	277.6	287.7	N/A	
224	298.4	262.1	311.5	286.7	277.0	287.2	N/A	
225	297.8	261.8	311.0	286.1	276.4	286.6	N/A	
226	297.1	261.4	310.3	285.5	276.0	286.1	N/A	
227	296.6	261.1	309.8	285.1	275.6	285.6	N/A	
228	296.0	260.7	309.3	284.5	275.3	285.2	N/A	
229	295.2	260.3	308.8	284.1	275.0	284.7	N/A	
230	294.5	259.9	308.3	283.5	274.7	284.2	N/A	
231	293.8	259.5	307.8	282.9	274.0	283.6	N/A	
232	293.1	259.2	307.3	282.4	273.4	283.1	N/A	
233	292.5	258.7	306.9	281.9	272.7	282.6	N/A	
234	291.8	258.3	306.6	281.4	272.3	282.1	N/A	
235	291.2	258.0	306.1	281.0	271.8	281.6	N/A	
236	290.6	257.5	305.7	280.4	271.3	281.1	N/A	
237	290.1	257.3	305.3	279.9	270.8	280.7	N/A	
238	289.5	256.7	304.8	279.4	270.3	280.2	N/A	
239	288.9	256.3	304.5	278.9	269.8	279.7	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
240	288.1	255.9	304.1	278.4	269.3	279.2	N/A
241	287.7	255.5	303.7	277.9	269.0	278.7	N/A
242	286.8	255.1	303.2	277.4	268.4	278.2	N/A
243	286.0	254.7	302.8	276.9	267.8	277.6	N/A
244	285.5	254.3	302.5	276.3	267.4	277.2	N/A
245	284.9	253.9	302.1	275.8	267.0	276.7	N/A
246	284.3	253.5	301.8	275.3	266.5	276.2	N/A
247	283.4	253.0	301.2	274.7	265.8	275.6	N/A
248	283.0	252.7	300.9	274.2	265.3	275.2	N/A
249	282.3	252.2	300.6	273.6	264.8	274.7	N/A
250	281.9	252.0	300.3	273.1	264.4	274.3	N/A
251	281.2	251.5	300.0	272.6	263.7	273.8	N/A
252	280.5	251.1	299.7	272.0	263.3	273.3	N/A
253	279.8	250.7	299.4	271.5	262.8	272.8	N/A
254	279.3	250.3	299.2	271.0	262.3	272.4	N/A
255	278.5	250.0	298.8	270.6	261.9	271.9	N/A
256	277.8	249.7	298.4	270.0	261.4	271.4	N/A
257	277.2	249.3	298.1	269.5	260.9	271.0	N/A
258	276.4	248.9	297.6	269.1	260.5	270.5	N/A
259	275.9	248.6	297.3	268.5	260.2	270.1	N/A
260	275.3	248.2	296.8	268.0	259.6	269.6	N/A
261	274.5	247.9	296.5	267.4	259.1	269.1	N/A
262	273.6	247.6	296.1	266.7	258.7	268.5	N/A
263	273.0	247.3	295.7	266.2	258.2	268.1	N/A
264	272.3	246.9	295.4	265.6	257.9	267.6	N/A
265	271.9	246.6	295.1	265.0	257.3	267.2	N/A
266	271.1	246.2	294.7	264.5	257.0	266.7	N/A
267	270.4	246.0	294.5	263.9	256.6	266.3	N/A
268	269.8	245.6	294.2	263.3	256.1	265.8	N/A
269	269.4	245.4	293.9	262.8	255.7	265.4	N/A
270	268.9	245.0	293.6	262.1	255.3	265.0	N/A
271	268.3	244.6	293.4	261.6	254.8	264.6	N/A
272	267.9	244.3	293.2	260.9	254.6	264.2	N/A
273	267.1	244.1	293.0	260.4	254.2	263.8	N/A
274	267.0	243.9	292.9	259.9	253.8	263.5	N/A
275	266.8	243.3	292.9	259.3	253.7	263.2	N/A
276	266.6	243.2	292.6	258.9	253.3	262.9	N/A
277	265.7	243.2	292.5	258.3	252.8	262.5	N/A
278	265.5	242.9	292.5	258.0	252.4	262.3	N/A
279	265.0	242.7	292.5	257.5	252.2	262.0	N/A
280	264.6	242.6	292.3	257.0	252.0	261.7	N/A
281	264.6	242.2	292.3	256.5	251.6	261.4	N/A
282	264.0	242.0	292.2	256.1	251.1	261.1	N/A
283	263.7	241.7	292.3	255.6	250.8	260.8	N/A
284	263.5	241.6	292.4	255.2	250.5	260.6	N/A
285	263.2	241.5	292.4	254.8	250.4	260.4	N/A
286	262.9	241.2	292.5	254.5	249.9	260.2	N/A
287	262.3	241.2	292.7	254.2	249.7	260.0	N/A

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
288	262.1	240.9	292.9	253.8	249.5	259.8	N/A	
289	261.7	240.7	293.0	253.5	249.2	259.6	N/A	
290	261.5	240.6	293.2	253.1	248.9	259.5	N/A	
291	261.4	240.3	293.4	252.8	248.6	259.3	N/A	
292	261.1	240.5	293.6	252.6	248.7	259.3	N/A	
293	261.0	240.3	293.8	252.3	248.7	259.2	N/A	
294	260.6	240.1	293.9	252.1	248.7	259.1	N/A	
295	260.9	240.2	294.2	251.9	248.7	259.2	N/A	
296	260.7	240.0	294.3	251.6	248.6	259.1	N/A	
297	260.9	240.0	294.5	251.5	248.6	259.1	N/A	
298	260.8	240.0	294.7	251.2	248.5	259.0	N/A	
299	260.8	240.0	294.9	251.1	248.3	259.0	N/A	
300	260.7	239.9	295.1	251.0	248.3	259.0	N/A	
301	260.8	239.6	295.4	251.1	248.2	259.0	N/A	
302	260.8	239.8	295.7	250.9	248.1	259.1	N/A	
303	260.9	239.7	296.0	250.7	247.9	259.0	N/A	
304	261.1	239.6	296.4	250.7	247.8	259.1	N/A	
305	260.8	239.5	296.6	250.6	247.7	259.1	N/A	
306	260.9	239.5	297.0	250.5	247.6	259.1	N/A	
307	260.7	239.3	297.4	250.4	247.5	259.1	N/A	
308	260.6	239.3	297.6	250.3	247.4	259.0	N/A	
309	260.4	239.1	298.0	250.2	247.3	259.0	N/A	
310	260.3	239.1	298.3	249.8	247.2	258.9	N/A	
311	260.0	239.0	298.6	249.4	247.1	258.8	N/A	
312	259.9	238.8	299.0	249.1	246.8	258.7	N/A	
313	259.9	238.5	299.0	248.8	246.6	258.5	N/A	
314	259.4	238.2	299.3	248.5	246.3	258.4	N/A	
315	259.2	237.9	299.4	247.9	246.1	258.1	N/A	
316	259.0	237.7	299.5	247.6	245.9	257.9	N/A	
317	258.9	237.8	299.7	247.3	245.6	257.9	N/A	
318	258.6	237.7	299.7	247.0	245.3	257.7	N/A	
319	258.3	237.4	300.1	246.5	245.1	257.5	N/A	
320	258.1	237.2	300.1	246.0	244.9	257.3	N/A	
321	257.6	237.0	300.2	245.7	244.7	257.0	N/A	
322	257.3	237.0	300.3	245.3	244.5	256.9	N/A	
323	256.8	236.7	300.3	244.9	244.3	256.6	N/A	
324	256.6	236.6	300.5	244.6	244.0	256.4	N/A	
325	256.1	236.3	300.3	244.2	243.7	256.1	N/A	
326	255.8	236.3	300.4	243.8	243.4	255.9	N/A	
327	255.5	236.1	300.5	243.4	243.2	255.7	N/A	
328	255.0	235.9	300.6	243.0	242.9	255.5	N/A	
329	254.4	235.8	300.4	242.6	242.6	255.2	N/A	
330	254.0	235.6	300.3	242.2	242.3	254.9	N/A	
331	253.7	235.5	300.4	241.9	242.0	254.7	N/A	
332	253.0	235.5	300.3	241.5	241.8	254.4	N/A	
333	252.6	235.4	300.2	241.1	241.5	254.1	N/A	
334	252.1	235.1	300.2	240.7	241.2	253.8	N/A	
335	251.5	235.0	299.9	240.3	241.0	253.5	N/A	

## WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
336	250.9	235.0	299.8	240.0	240.6	253.3	N/A
337	250.6	234.8	299.6	239.6	240.4	253.0	N/A
338	250.1	234.8	299.4	239.3	240.1	252.7	N/A
339	249.6	234.7	299.4	238.9	239.7	252.5	N/A
340	249.2	234.6	299.1	238.5	239.5	252.2	N/A
341	248.8	234.4	299.1	238.2	239.1	251.9	N/A
342	248.5	234.4	299.1	237.7	238.7	251.7	N/A
343	248.2	234.2	299.3	237.4	238.5	251.5	N/A
344	248.0	234.1	299.7	237.1	238.1	251.4	N/A
345	247.5	234.0	299.8	236.8	237.9	251.2	N/A
Average	439.8	287.7	348.8	322.1	315.6	343	N/A

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/7/2023

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0143	188.8	193.0	4.2
	<b>B</b>	H0144	188.7	192.5	3.8
	<b>C - 1st Hour</b>	H0145	188.7	189.6	0.9
	<b>Amb</b>	H0155	94.9	95.0	0.1
<b>Probes</b>	<b>A</b>	7A	116557.4	116557.5	0.1
	<b>B</b>	7B	117128.2	117128.3	0.1
	<b>C - 1st Hour</b>	7C	116550.7	116550.9	0.2
<b>O-rings</b>	<b>A</b>	7A	3572.0	3572.1	0.1
	<b>B</b>	7B	3523.1	3523.2	0.1
	<b>C - 1st Hour</b>	7C	3406.7	3406.9	0.2

**Placed in Desiccator on:** 6/12 - 10:30

**Balance Audit (mg):** 100.0 100.0 100.0   
*Undesiccated                      Dessicated                      Dessicated                      Desiccated*

		Undesiccated	Dessicated	Dessicated	Desiccated
<b>Filters</b>	<b>A</b>	193.2 6/7 18:07	193.0 6/14 10:45	193.0 6/15 12:32	
	<b>B</b>	192.7 6/7 18:06	192.6 6/14 10:46	192.5 6/15 12:32	
	<b>C - 1st Hour</b>	189.8 6/7 13:02	189.7 6/14 10:46	189.6 6/15 12:33	
	<b>Amb</b>	95.2 6/7 18:06	95.1 6/14 10:46	95.0 6/15 12:33	
<b>Probes</b>	<b>A</b>		116557.4 6/14 10:55	116557.5 6/15 12:44	
	<b>B</b>		117128.3 6/14 10:55	117128.3 6/15 12:44	
	<b>C - 1st Hour</b>		116550.7 6/14 10:56	116550.9 6/15 12:45	
<b>O-Rings</b>	<b>A</b>		3572.2 6/14 10:35	3572.1 6/15 12:22	
	<b>B</b>		3523.1 6/14 10:35	3523.2 6/15 12:23	
	<b>C - 1st Hour</b>		3406.8 6/14 10:36	3406.9 6/15 12:23	

<b>Train A Aggregate, mg:</b>	<b>4.4</b>
<b>Train B Aggregate, mg:</b>	<b>4.0</b>
<b>Train C Aggregate, mg:</b>	<b>1.3</b>
<b>Ambient Aggregate, mg:</b>	<b>0.1</b>

## ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
 Model: 1.7R Run Number: 5 Test Date: 6/8/2023

### Wood Heater Run Notes

#### High Fire Test Notes

Test Burn Start Time: 9:54  
 Air Control Setting: Fully Open

Time	Notes
9:54	Light newspaper on top of kindling with torch (10 seconds) left door open Door closed, fan off, air set to high (fully open) @ 2.32 lbs, leveled coal bed and loaded high fire test load, door left open Closed door, fan turned on to max speed Unable to maintain sample rates for both sample trains, had to change filters out for both trains, Prior to changing, leak test was done, both trains had a leakage rate 0.001 cfm at a vacuum of 10 inHg. Train A Volume Prior to Leak Check: 525.387, After Leak Check: 525.428, Net: 0.041 ft <sup>3</sup> Train B Volume Prior to Leak Check: 598.991, After Leak Check: 599.021, Net: 0.030 ft <sup>3</sup>
9:57	
10:25	
10:30	
10:54	
12:06	Ended test at 3.64 lbs (2.32 lbs coal bed + 1.34 lbs of high fire load) remaining

Test Burn End Time: 12:06

#### Low/Medium Fire Test Notes

Test Burn Start Time: N/A  
 Air Control Setting: N/A

Time	Notes

Test Burn End Time: N/A

### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 18.00 CO (%): 4.35  
 Mid Gas CO<sub>2</sub> (%): 10.10 CO (%): 1.98

#### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:40	8:45	8:43	8:20	8:15	8:25
CO <sub>2</sub>	0.00	10.02	18.01	0.02	9.98	18.11
CO	0.000	1.967	4.352	-0.009	1.956	4.324

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

Technician Signature: 

Date: 7/5/2023

# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 5 Test Date: 6/8/2023

## Test Photos



**Kindling Fuel Load**



**Start-up Fuel Load**



**Kindling & Start-up Loaded in Stove**



**High Fire Fuel Load**

Technician Signature: *Sebastian E. Cotton*

Date: 7/5/2023

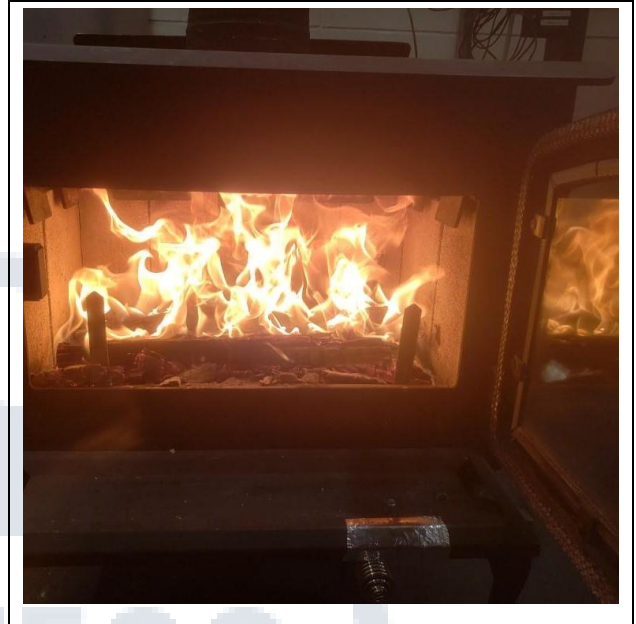


# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 5 Test Date: 6/8/2023



Residual Start-up Fuel Coal Bed – Pre Rake



Residual Start-up Fuel Coal Bed – Post Rake



High Fire Fuel Loaded



Air Setting – High Fire

Technician Signature: *Sebastian Euteneier*

Date: 7/5/2023

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 5 Data Summary**

Client: SBI  
Model: 1.7R  
Job #: 23-161  
Tracking #: 135  
Test Date: 6/8/2023

A handwritten signature in black ink, appearing to read "Sebastian E. [unclear]".

\_\_\_\_\_  
Technician Signature

7/5/2023  
\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI

Model: 1.7R

Run #: 5

Job #: 23-161

Tracking #: 135

Technician: SJB

Date: 6/8/2023

<b>Burn Rate (kg/hr):</b>	<b>2.92</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	24.447	23.373	22.704	8.991
Average Gas Velocity in Dilution Tunnel (ft/sec)	24.76			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	28367.4			
Average Gas Meter Temperature (°F)	84.8	76.0	74.6	74.3
Total Sample Volume (dscf)	23.616	23.294	22.563	8.768
Average Tunnel Temperature (°F)	99.8			
Total Time of Test (min)	132			
Total Particulate Catch (mg)	0.0	8.7	7.9	3.1
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0003735	0.0003501	0.0003535
Total PM Emissions (g)	0.00	23.31	21.85	10.03
Particulate Emission Rate (g/hr)	0.00	10.59	9.93	10.03
Emissions Factor (g/kg)	-	3.60	3.38	-
Difference from Average Total Particulate Emissions (g)	-	0.73	0.73	-
Difference from Average Total Particulate Emissions (%)	-	3.2%	3.2%	-
Difference from Average Emissions Factor (g/kg)	-	0.11	0.11	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	22.58
Particulate Emission Rate (g/hr)	10.26
Emissions Factor (g/kg)	3.49
HHV Efficiency (%)	66.6%
LHV Efficiency (%)	71.3%
CO Emissions (g/min)	1.51

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 81.8/Max: 87.9	OK
Face Velocity	< 30 ft/min	9.7	OK
Leakage Rate	Less than 4% of average sample rate	0.003 cfm	OK
Ambient Temp	55-90 °F	Min:77.2/Max:89.8	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 06/08/23  
**Run:** 5  
**Control #:** 23-161  
**Test Duration:** 100  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	66.6%	71.3%
<b>Combustion Efficiency</b>	98.2%	98.2%
<b>Heat Transfer Efficiency</b>	67.8%	72.6%

<b>Output Rate (kJ/h)</b>	37,628	35,694	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	3.01	6.63	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	56,533	53,628	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	5.01	11.05	<b>dry lb</b>
<b>MC wet (%)</b>	18.19		
<b>MC dry (%)</b>	22.23		
<b>Particulate (g )</b>	22.58		
<b>CO (g)</b>	151		
<b>Test Duration (h)</b>	1.67		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.36	2.41
<b>g/kg Dry Fuel</b>	4.51	30.19
<b>g/h</b>	13.55	90.79
<b>g/min</b>	0.23	1.51
<b>lb/MM Btu Output</b>	0.84	5.61

<b>Air/Fuel Ratio (A/F)</b>	14.00
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VERSION:

2.4

4/15/2010

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking # 135  
 Technician: SJB  
 Date: 6/8/2023

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.95  
 Max Allowable Start-up Fuel Weight (lbs): 4.42

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	3.01	In Range	17.1	23.6	26.0	22.2	In Range	2.46	1.12
2	15.75	3.41	In Range	27.8	25.9	23.6	25.8	In Range	2.71	1.23
3	15.75	2.59	In Range	22.0	21.2	24.5	22.6	In Range	2.11	0.96
Core Load Wt. (lbs)		9.00	In Range							

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	3.47	In Range	21.2	24.8	15.4	20.5	In Range	2.88	1.31
2	15.75	2.26	In Range	15.8	24.3	18.4	19.5	In Range	1.89	0.86
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		5.74	In Range							

Total Load Weight (lbs): 14.74 In Range  
 Core Load % of Total Weight: 61% In Range 45-65%  
 Remainder % of Total Weight: 39% In Range 35-55%  
 Total Load % of Target Weight: 102% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.2  
 Total Load Average Moisture Content (%DB): 22.2 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 18.2  
 Total Test Load Weight (dry basis): 12.06 lbs 5.47 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.82	In Range	10	10	10	10.0	In Range	2.56	1.16

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
3.99	In Range	21.6	21.5	18.1	20.4	In Range	3.32	1.50

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 2.32 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.3 to 1.62 lb  
 Actual Fuel Load Ending Weight (lb): 1.34 In Range

Total Weight All Fuel Added: 21.55 lbs, wet basis  
 17.93 lbs, dry basis  
 8.13 kg, dry basis

Total Weight All Fuel Burned (dry basis): 14.27 lbs  
 6.47 kg

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5  
 Test Start Time: 9:54  
 Test Type: High Fire

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Recording Interval (min): 1  
 Total Sampling Time (min): 132  
 High Fire Test Load Time (min): 32

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0.0005  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 6/5/2023  
 Test Fuel Scale Audit (kg): 5.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.52	29.56	29.54
Relative Humidity (%)	41.7	39.5	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Platform Scale Audit (kg)	5.0	5.0	

Ambient Sample Volume: 24.447 ft<sup>3</sup>

### Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.001	0.000	cfm @	-8 in. Hg
(B)	0.001	0.003	cfm @	-5 in. Hg
(C)	0.000	0.001	cfm @	-5 in. Hg
(Ambient)	0.000	0.000	cfm @	-5 in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.126	74
2	0.151	74
3	0.152	74
4	0.132	74
5	0.101	74
6	0.141	74
7	0.151	74
8	0.136	74
Center	0.157	74

Dilution Tunnel H<sub>2</sub>O: 2.00 percent

Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 24.73 ft/sec

V<sub>scant</sub>: 26.60 ft/sec

F<sub>p</sub>: 0.930 [ratio]

Initial Tunnel Flow: 495.0 scf/min

Static Pressure: -0.323 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

**WOODSTOVE PREBURN DATA**

Client: SBI  
Model: 1.7R  
Run #: 5

Job #: 23-161  
Tracking #: 135  
Technician: SJB  
Date: 6/8/2023

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

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	516.152		0.157	0.88	74.7	0.00		6.95		74.9	77.4	84.0	77.2
1			0.155	0.92	75.4	0.67	-	6.86	-0.08	78.7	119.7	82.9	77.5
2			0.154	0.93	75.4	0.70	-	6.79	-0.07	80.3	147.1	82.9	78.0
3			0.153	0.94	75.5	0.67	-	6.72	-0.07	82.8	172.8	83.1	78.1
4			0.155	0.93	75.5	0.68	-	6.64	-0.09	78.5	190.2	83.1	78.4
5			0.155	0.94	75.5	0.68	-	6.57	-0.07	77.8	206.8	82.8	78.5
6			0.154	0.96	75.5	0.68	-	6.44	-0.13	78.9	246.9	83.0	79.0
7			0.153	0.97	75.5	0.71	-	6.30	-0.14	81.1	320.2	83.3	78.4
8			0.153	0.96	75.6	0.72	-	6.15	-0.15	82.7	371.5	83.5	77.8
9			0.153	0.95	75.5	0.74	-	6.01	-0.14	83.7	397.3	83.7	77.6
10	517.952	0.180	0.153	0.97	75.6	0.75	98	5.88	-0.13	84.6	413.9	83.8	78.6
11			0.153	0.96	75.5	0.76	-	5.74	-0.14	85.1	420.2	84.0	79.0
12			0.153	0.94	75.5	0.76	-	5.60	-0.14	86.0	436.0	84.4	79.6
13			0.152	0.96	75.6	0.79	-	5.42	-0.18	87.4	463.0	84.6	79.9
14			0.151	0.98	75.5	0.80	-	5.25	-0.17	88.9	490.5	85.0	80.4
15			0.151	0.98	75.5	0.81	-	5.07	-0.18	89.7	502.1	85.2	79.9
16			0.151	0.95	75.5	0.81	-	4.87	-0.20	90.6	512.9	85.4	79.6
17			0.151	0.96	75.6	0.81	-	4.68	-0.19	91.7	526.3	85.6	79.9
18			0.150	0.96	75.6	0.81	-	4.48	-0.20	92.8	539.2	85.5	80.7
19			0.151	0.95	75.6	0.82	-	4.29	-0.20	93.2	541.7	85.6	81.6
20	519.747	0.179	0.152	0.94	75.6	0.80	100	4.09	-0.20	93.5	543.4	85.6	82.5
21			0.150	0.95	75.6	0.83	-	3.88	-0.21	94.2	548.8	85.4	82.8
22			0.150	0.97	75.6	0.82	-	3.68	-0.20	94.7	553.3	85.4	82.4
23			0.150	0.99	75.7	0.82	-	3.49	-0.19	95.0	554.7	85.2	82.1
24			0.150	0.95	75.7	0.84	-	3.29	-0.20	95.3	553.7	85.1	82.5
25			0.151	1.00	75.7	0.83	-	3.15	-0.15	95.4	547.6	85.1	83.7
26			0.151	1.03	75.6	0.84	-	2.98	-0.17	95.3	543.1	85.0	84.4
27			0.151	0.98	75.6	0.84	-	2.82	-0.16	95.1	539.7	85.1	85.1
28			0.150	0.98	75.6	0.86	-	2.66	-0.16	95.1	534.1	85.0	84.8
29			0.150	1.04	75.7	0.85	-	2.53	-0.13	95.0	529.5	84.9	84.7
30	521.531	0.178	0.150	1.03	75.6	0.84	100	2.42	-0.11	97.2	526.9	85.1	82.6
31			0.151	1.00	75.6	0.85	-	2.32	-0.10	95.3	520.8	84.9	84.3
32			0.145	1.02	75.6	0.86	-	17.06	14.74	126.1	543.9	86.8	85.9



# BOX A TEST DATA - ASTM E3053 /

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Due to filters plugging, the sample filters were being changed during this interval. As a result the temperature probes were unplugged for these reading and recorded open channel values. These values were removed from the data set for clarity

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.146	1.03	75.6	0.91	-	16.79	-0.28	118.9	456.1	86.8	86.3
34			0.146	1.07	75.6	0.94	-	16.58	-0.21	121.2	442.8	86.9	86.6
35			0.146	1.04	75.5	0.96	-	16.54	-0.04	120.5	419.4	87.0	85.0
36			0.141	1.03	75.5	1.11	-	16.28	-0.26	129.5	479.9	87.1	86.0
37			0.148	1.08	75.6	1.17	-	16.09	-0.19	106.4	500.0	85.0	86.5
38			0.149	1.09	75.6	1.15	-	15.94	-0.15	99.7	497.3	83.8	87.4
39			0.152	1.07	75.7	1.15	-	15.82	-0.12	97.3	489.6	83.5	87.5
40	523.322	0.179	0.151	1.10	75.7	1.16	101	15.71	-0.12	95.8	479.9	83.1	88.5
41			0.151	1.11	75.7	1.17	-	15.60	-0.11	94.6	469.5	82.8	88.1
42			0.152	1.09	75.6	1.21	-	15.52	-0.08	93.7	456.6	82.7	88.0
43			0.152	1.09	75.6	1.33	-	15.44	-0.07	93.0	442.7	82.3	88.3
44			0.152	1.10	75.7	1.44	-	15.34	-0.10	93.1	436.7	82.1	88.4
45			0.152	1.13	75.7	1.86	-	15.28	-0.06	92.4	425.1	82.3	88.6
46			0.150	1.13	75.8	2.44	-	15.20	-0.08	91.9	415.6	83.0	89.8
47			0.151	1.12	75.8	3.29	-	15.10	-0.10	95.5	411.0	83.7	89.1
48			0.151	1.09	75.8	4.56	-	15.03	-0.07	96.8	407.3	84.3	87.8
49			0.152	1.12	75.8	6.59	-	14.97	-0.07	96.4	399.7	84.9	86.8
50	525.116	0.179	0.150	1.15	75.9	5.49	101	14.89	-0.08	96.1	394.1	85.6	86.8
51			0.151	1.05	75.9	5.45	-	14.82	-0.07	95.8	390.8	86.2	86.6
52			0.152	1.08	75.6	9.39	-	14.75	-0.07	95.8	386.9		85.6
53			0.150	1.09	75.9	0.78	-	14.68	-0.07	95.2	383.8	87.6	84.7
54			0.152	1.04	75.9	0.71	-	14.61	-0.07	93.1	380.3	87.3	85.3
55			0.152	0.96	76.0	0.70	-	14.54	-0.07	91.8	376.4	86.5	86.6
56			0.151	1.15	76.0	0.69	-	14.46	-0.08	91.4	373.0	86.0	86.5
57			0.152	1.06	76.0	0.69	-	14.36	-0.09	91.0	369.7	85.4	86.9
58			0.151	1.17	76.1	0.69	-	14.29	-0.08	90.8	365.7	85.0	87.1
59			0.151	1.19	76.1	0.69	-	14.21	-0.07	91.9	362.3	84.4	87.2
60	526.691	0.158	0.152	1.04	76.1	0.69	88	14.13	-0.09	93.2	360.1	84.1	87.0
61			0.152	1.01	76.1	0.70	-	14.05	-0.08	93.5	357.4	83.7	86.4
62			0.153	1.04	76.2	0.69	-	13.97	-0.08	93.4	355.3	83.4	86.4
63			0.152	0.96	76.2	0.70	-	13.89	-0.07	93.4	353.6	83.0	86.0
64			0.151	0.99	76.2	0.70	-	13.82	-0.08	93.3	352.3	83.0	86.0
65			0.152	0.85	76.2	0.70	-	13.73	-0.09	93.1	353.2	82.5	86.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.152	0.84	76.2	0.71	-	13.64	-0.09	93.1	354.6	82.4	86.2
67			0.152	0.88	76.2	0.71	-	13.56	-0.08	93.1	353.7	82.2	86.0
68			0.152	0.79	76.2	0.71	-	13.47	-0.09	92.9	353.2	81.9	86.2
69			0.152	0.80	76.2	0.70	-	13.40	-0.07	93.0	352.7	81.8	86.0
70	528.488	0.180	0.150	0.87	76.2	0.74	101	13.31	-0.08	93.0	354.1	82.4	86.1
71			0.151	0.85	76.2	0.70	-	13.21	-0.10	93.0	355.2	82.7	86.0
72			0.151	0.92	76.2	0.73	-	13.13	-0.09	93.2	357.9	83.4	85.9
73			0.151	0.88	76.2	0.72	-	13.02	-0.10	93.3	360.9	83.7	85.8
74			0.151	0.83	76.3	0.76	-	12.92	-0.11	93.4	365.6	84.2	85.9
75			0.151	0.85	76.3	0.74	-	12.82	-0.10	94.1	375.1	84.6	85.7
76			0.151	0.78	76.3	0.75	-	12.70	-0.12	95.0	387.3	85.1	84.5
77			0.151	0.86	76.4	0.75	-	12.57	-0.13	95.4	411.7	85.6	85.0
78			0.150	0.77	76.4	0.75	-	12.43	-0.15	96.4	433.7	86.0	85.4
79			0.151	0.66	76.4	0.74	-	12.25	-0.18	97.9	467.3	86.3	85.6
80	530.281	0.179	0.151	0.74	76.3	0.74	101	12.06	-0.18	99.9	504.5	86.8	85.9
81			0.150	0.80	76.3	0.75	-	11.85	-0.21	101.4	533.6	87.5	86.1
82			0.151	0.82	76.3	0.74	-	11.65	-0.20	102.9	551.5	87.9	86.4
83			0.150	0.77	76.3	0.75	-	11.44	-0.21	103.9	565.0	87.8	86.6
84			0.151	0.79	76.4	0.76	-	11.24	-0.20	104.7	576.6	87.6	86.6
85			0.151	0.76	76.4	0.76	-	11.03	-0.21	105.9	587.3	87.3	86.8
86			0.149	0.70	76.4	0.76	-	10.82	-0.20	106.9	595.7	87.1	87.1
87			0.150	0.76	76.5	0.76	-	10.60	-0.22	107.7	604.0	87.0	87.3
88			0.148	0.66	76.5	0.78	-	10.39	-0.21	108.5	611.4	86.7	87.6
89			0.149	0.66	76.5	0.78	-	10.16	-0.22	109.4	618.2	86.7	87.9
90	532.075	0.179	0.148	0.67	76.5	0.78	102	9.94	-0.23	110.2	624.6	86.6	88.0
91			0.148	0.66	76.5	0.78	-	9.72	-0.22	110.9	630.7	86.4	88.4
92			0.148	0.71	76.6	0.77	-	9.50	-0.22	111.4	634.0	86.2	88.6
93			0.148	0.69	76.5	0.81	-	9.28	-0.22	112.1	637.8	86.0	88.9
94			0.148	0.67	76.5	0.81	-	9.07	-0.20	113.8	641.9	86.1	86.7
95			0.148	0.69	76.5	0.81	-	8.88	-0.19	113.1	648.7	85.9	84.5
96			0.147	0.69	76.5	0.81	-	8.70	-0.18	112.4	650.4	85.7	84.9
97			0.148	0.69	76.5	0.83	-	8.51	-0.19	112.1	649.2	85.7	84.1
98			0.149	0.70	76.5	0.83	-	8.32	-0.19	111.5	650.1	85.5	84.4

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.149	0.69	76.5	0.84	-	8.14	-0.18	111.2	649.2	85.5	84.8
100	533.858	0.178	0.148	0.67	76.5	0.85	102	7.95	-0.19	111.1	645.9	85.4	85.6
101			0.149	0.68	76.5	0.87	-	7.76	-0.19	110.9	645.3	85.2	85.1
102			0.147	0.69	76.4	0.88	-	7.59	-0.17	111.1	644.7	85.0	84.8
103			0.148	0.69	76.5	0.91	-	7.40	-0.19	110.9	642.7	84.9	84.2
104			0.148	0.69	76.5	0.91	-	7.23	-0.17	110.8	640.3	84.9	84.6
105			0.150	0.69	76.5	0.90	-	7.05	-0.18	110.8	637.8	84.8	84.6
106			0.149	0.68	76.4	0.90	-	6.87	-0.18	110.6	637.4	84.6	85.3
107			0.149	0.69	76.4	0.93	-	6.69	-0.19	110.5	636.6	84.6	85.3
108			0.149	0.70	76.4	0.95	-	6.52	-0.16	110.7	635.0	84.4	84.9
109			0.149	0.68	76.4	0.95	-	6.36	-0.17	110.6	634.1	84.3	85.4
110	535.645	0.179	0.148	0.68	76.4	0.97	103	6.19	-0.17	110.5	630.6	84.2	85.4
111			0.149	0.69	76.4	1.00	-	6.05	-0.14	110.0	626.1	84.2	85.3
112			0.149	0.68	76.4	1.01	-	5.89	-0.15	109.9	622.3	84.2	85.3
113			0.149	0.71	76.4	1.04	-	5.75	-0.14	109.9	618.4	84.1	85.2
114			0.148	0.73	76.4	1.04	-	5.61	-0.14	109.4	614.4	84.0	85.3
115			0.149	0.70	76.4	1.05	-	5.46	-0.15	109.6	613.8	83.8	85.2
116			0.149	0.70	76.3	1.09	-	5.30	-0.16	109.9	618.2	83.8	85.4
117			0.148	0.73	76.3	1.24	-	5.17	-0.13	109.8	620.6	83.8	85.3
118			0.148	0.71	76.3	1.36	-	5.02	-0.15	109.7	620.5	83.6	85.1
119			0.148	0.69	76.3	1.44	-	4.89	-0.13	109.7	617.4	83.3	84.9
120	537.420	0.177	0.150	0.71	76.4	1.61	101	4.75	-0.14	109.3	609.4	83.3	85.1
121			0.148	0.72	76.3	1.67	-	4.64	-0.11	109.0	601.7	83.5	85.6
122			0.148	0.74	76.4	1.74	-	4.53	-0.11	108.5	594.8	83.5	85.4
123			0.147	0.75	76.3	1.82	-	4.41	-0.13	108.1	588.9	83.6	84.9
124			0.148	0.74	76.3	1.89	-	4.30	-0.11	107.7	583.2	83.4	85.1
125			0.149	0.75	76.3	2.13	-	4.20	-0.10	107.4	579.0	83.8	85.0
126			0.150	0.74	76.4	2.32	-	4.11	-0.10	107.4	576.0	83.7	85.6
127			0.149	0.76	76.4	2.42	-	4.00	-0.11	107.1	573.9	83.7	85.1
128			0.148	0.73	76.4	2.62	-	3.89	-0.10	107.0	570.1	83.8	85.3
129			0.149	0.72	76.5	2.77	-	3.80	-0.10	106.8	566.3	83.9	84.4
130	539.205	0.179	0.148	0.68	76.5	2.81	102	3.71	-0.08	106.5	563.0	83.9	85.8
131			0.150	0.70	76.4	2.86	-	3.64	-0.07	106.1	559.2	84.0	85.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	539.566	0.180	0.149	0.67	76.5	2.87	103	3.56	-0.08	105.8	553.2	84.1	85.7
Avg/Tot	23.373	0.178	0.150	0.88	76.0	1.22	100			99.8	490.6	84.7	84.8

This value is final DGM value - Initial DGM value - Volume increase recorded during mid-test leak check procedures (0.041 ft3)

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	589.673		0.34	74.1	0.00		83.5	0.001	0.00	(0.034)	40.2	48.6
1			0.35	74.3	0.63	-	82.9	0.026	1.23	(0.006)	41.0	52.2
2			0.35	74.2	0.67	-	83.0	0.029	1.45	0.000	39.3	52.5
3			0.35	74.3	0.78	-	83.1	0.037	1.40	(0.013)	38.2	53.4
4			0.36	74.3	0.73	-	83.2	0.035	3.73	0.078	39.6	51.3
5			0.36	74.3	0.67	-	83.3	0.042	4.05	0.111	42.0	52.2
6			0.36	74.2	0.78	-	83.5	0.055	5.26	0.113	43.2	53.8
7			0.37	74.2	0.75	-	83.5	0.067	7.89	0.070	44.1	56.3
8			0.35	74.2	0.67	-	83.7	0.068	9.07	0.118	43.2	57.4
9			0.37	74.2	0.72	-	83.8	0.070	8.26	0.100	42.3	57.6
10	591.428	0.176	0.36	74.3	0.70	99	83.8	0.070	8.45	0.047	41.3	57.7
11			0.36	74.3	0.73	-	84.0	0.071	7.79	0.067	40.5	57.6
12			0.36	74.2	0.73	-	84.1	0.075	8.74	0.084	40.0	57.9
13			0.36	74.3	0.76	-	84.1	0.078	9.56	0.081	39.7	58.8
14			0.34	74.3	0.79	-	84.3	0.080	10.82	0.106	39.2	59.9
15			0.38	74.3	0.86	-	84.5	0.081	10.89	0.134	38.4	60.3
16			0.37	74.3	0.82	-	84.5	0.083	10.27	0.122	38.2	60.6
17			0.36	74.3	0.76	-	84.6	0.084	11.07	0.147	37.7	61.3
18			0.37	74.3	0.77	-	84.5	0.084	11.37	0.181	37.4	62.1
19			0.38	74.3	0.79	-	84.6	0.083	11.90	0.145	36.6	61.9
20	593.162	0.173	0.36	74.3	0.78	99	84.6	0.085	11.54	0.099	36.0	61.7
21			0.36	74.3	0.87	-	84.5	0.084	12.00	0.148	35.3	61.9
22			0.38	74.3	0.78	-	84.5	0.085	12.23	0.145	34.9	61.9
23			0.35	74.3	0.79	-	84.5	0.085	12.10	0.146	34.6	61.9
24			0.37	74.3	0.89	-	84.5	0.086	12.40	0.224	34.2	61.9
25			0.34	74.3	0.91	-	84.5	0.084	11.38	0.105	33.0	61.0
26			0.32	74.3	0.88	-	84.5	0.083	11.03	0.030	32.6	60.4
27			0.36	74.3	0.87	-	84.5	0.083	11.07	0.041	32.3	60.1
28			0.34	74.3	0.82	-	84.5	0.083	10.50	0.004	31.8	59.5
29			0.28	74.3	0.82	-	84.5	0.083	10.15	0.004	31.5	59.4
30	594.903	0.174	0.38	74.2	0.83	101	84.5	0.082	9.59	0.014	29.4	60.1
31			0.33	74.2	0.81	-	84.5	0.081	9.34	0.015	30.3	58.5
32			0.31	74.2	0.93	-	84.5	0.081	6.16	0.081	29.9	60.4
33			0.27	74.2	0.87	-	84.5	0.070	2.11	0.091	29.7	60.6
34			0.32	74.2	0.96	-	84.5	0.082	1.96	0.050	28.9	61.2
35			0.27	74.1	1.00	-	84.3	0.076	2.20	0.052	28.9	61.2
36			0.26	74.1	1.07	-	84.3	0.092	3.73	0.099	28.9	61.2
37			0.28	74.2	1.14	-	84.1	0.081	9.59	0.156	25.7	62.8
38			0.29	74.2	1.14	-	83.8	0.080	8.96	0.061	28.4	61.2

## BOX B TEST DATA - ASTM E3053 / AS

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Due to filters plugging, the sample filters were being changed during this interval. As a result the temperature probes were unplugged for these reading and recorded open channel values. These values were removed from the data set for clarity

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.24	74.2	1.09	-	83.5	0.079	7.60	0.161	29.1	59.7
40	596.648	0.175	0.30	74.2	1.11	101	83.3	0.078	6.87	0.190	29.8	58.8
41			0.24	74.2	1.15	-	83.1	0.075	6.14	0.227	30.2	58.1
42			0.30	74.2	1.12	-	82.9	0.073	5.44	0.276	30.4	57.6
43			0.31	74.2	1.20	-	82.5	0.072	4.85	0.333	30.6	57.0
44			0.30	74.2	1.29	-	82.3	0.072	4.85	0.272	30.4	56.8
45			0.20	74.2	1.60	-	82.6	0.069	4.82	0.280	30.5	56.5
46			0.22	74.3	2.01	-	83.2	0.069	4.57	0.272	30.8	56.1
47			0.19	74.3	2.55	-	83.7	0.068	4.51	0.257	28.6	57.2
48			0.18	74.3	3.32	-	84.0	0.067	4.56	0.253	27.8	57.2
49			0.20	74.3	5.31	-	84.7	0.066	4.29	0.277	27.8	57.0
50	598.380	0.173	0.18	74.4	5.32	100	85.0	0.066	4.26	0.254	27.9	56.8
51			0.12	74.5	5.36	-	85.6	0.066	4.35	0.244	28.0	56.7
52			0.11	74.5	5.31	-	85.9	0.066	4.34	0.249	27.9	56.7
53			0.11	74.5	5.29	-	86.4	0.065	4.32	0.251	28.1	56.5
54			0.08	74.4	6.09	-		0.065	4.37	0.256	29.3	55.9
55			0.10	74.3	-0.01	-		0.065	4.33	0.274	30.4	55.8
56			0.12	74.6	0.72	-	87.2	0.065	4.33	0.282	30.7	55.6
57			0.13	74.5	0.72	-	86.5	0.065	4.24	0.303	31.0	55.6
58			0.14	74.6	0.79	-	85.8	0.063	4.19	0.316	31.3	55.6
59			0.15	74.7	0.79	-	85.4	0.063	4.07	0.332	31.1	55.8
60	599.891	0.151	0.14	74.7	0.72	87	84.9	0.062	3.99	0.352	29.7	56.1
61			0.14	74.7	0.78	-	84.5	0.062	3.89	0.373	29.5	56.1
62			0.15	74.7	0.70	-	84.2	0.062	3.88	0.384	29.5	56.1
63			0.15	74.7	0.80	-	83.9	0.062	3.82	0.400	29.5	55.9
64			0.16	74.7	0.75	-	83.6	0.061	3.83	0.405	29.7	55.9
65			0.16	74.7	0.70	-	83.3	0.062	3.99	0.384	29.9	56.3
66			0.18	74.7	0.70	-	83.0	0.062	4.14	0.360	29.9	56.3
67			0.18	74.7	0.71	-	82.8	0.062	4.20	0.324	29.9	56.3
68			0.17	74.7	0.70	-	82.5	0.062	4.14	0.327	30.1	56.1
69			0.20	74.7	0.72	-	82.3	0.063	4.16	0.331	30.0	56.1
70	601.645	0.175	0.19	74.7	0.80	101	82.6	0.063	4.29	0.334	30.2	56.3
71			0.19	74.8	0.80	-	83.1	0.062	4.39	0.346	30.4	56.5
72			0.17	74.7	0.80	-	83.4	0.063	4.45	0.364	30.4	56.7
73			0.20	74.7	0.81	-	83.8	0.064	4.59	0.387	30.5	56.8
74			0.19	74.8	0.81	-	84.2	0.064	4.74	0.383	30.6	57.2
75			0.17	74.8	0.74	-	84.5	0.067	4.87	0.397	30.6	57.4
76			0.18	74.9	0.82	-	84.9	0.071	5.11	0.405	30.2	57.9
77			0.19	74.9	0.83	-	85.3	0.075	6.52	0.273	30.8	58.8

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.20	74.9	0.77	-	85.7	0.075	7.48	0.264	30.7	59.5
79			0.19	74.8	0.77	-	86.0	0.082	8.73	0.220	30.7	60.8
80	603.385	0.174	0.20	74.8	0.76	101	86.4	0.085	10.29	0.132	30.3	61.9
81			0.19	74.8	0.75	-	86.9	0.085	11.27	0.114	29.6	62.6
82			0.20	74.9	0.84	-	87.0	0.086	11.40	0.177	28.7	63.0
83			0.19	74.9	0.75	-	87.0	0.089	11.63	0.250	28.0	63.3
84			0.19	75.0	0.81	-	86.8	0.089	11.72	0.334	27.5	63.5
85			0.18	75.0	0.79	-	86.4	0.090	11.85	0.406	26.9	63.9
86			0.19	75.0	0.75	-	86.2	0.090	11.97	0.466	26.4	64.0
87			0.19	75.1	0.78	-	86.0	0.091	12.14	0.466	26.0	64.4
88			0.21	75.2	0.84	-	85.9	0.092	12.32	0.516	25.6	64.6
89			0.18	75.2	0.81	-	85.7	0.093	12.59	0.521	25.0	64.9
90	605.127	0.174	0.20	75.2	0.86	102	85.6	0.093	13.00	0.494	24.8	65.3
91			0.18	75.2	0.85	-	85.4	0.093	13.21	0.485	24.5	65.3
92			0.20	75.2	0.76	-	85.3	0.093	13.32	0.445	24.1	65.5
93			0.20	75.1	0.86	-	85.1	0.093	13.35	0.444	23.8	65.5
94			0.20	75.1	0.78	-	84.8	0.094	13.35	0.383	22.9	65.8
95			0.20	75.1	0.79	-	84.7	0.094	13.64	0.391	23.3	65.8
96			0.20	75.1	0.88	-	84.6	0.094	13.64	0.411	23.4	65.7
97			0.20	75.1	0.90	-	84.5	0.093	13.51	0.379	23.5	65.1
98			0.22	75.1	0.89	-	84.3	0.093	13.47	0.342	23.7	65.1
99			0.21	75.1	0.90	-	84.2	0.092	13.41	0.307	23.7	64.8
100	606.857	0.173	0.21	75.1	0.85	102	84.0	0.092	13.24	0.235	23.4	64.6
101			0.21	75.1	0.88	-	83.9	0.093	13.12	0.196	23.5	64.4
102			0.24	75.0	0.86	-	83.7	0.093	13.10	0.145	23.3	64.2
103			0.23	75.0	0.89	-	83.6	0.092	12.94	0.140	23.2	63.9
104			0.22	75.0	0.90	-	83.4	0.092	12.72	0.114	23.1	63.7
105			0.22	75.0	0.97	-	83.3	0.091	12.60	0.115	22.9	63.5
106			0.21	75.0	0.88	-	83.1	0.091	12.68	0.092	23.0	63.5
107			0.22	74.9	1.00	-	83.1	0.091	12.64	0.080	22.9	63.3
108			0.21	74.9	0.92	-	82.9	0.091	12.48	0.060	22.8	63.3
109			0.20	74.9	0.94	-	82.8	0.091	12.36	0.051	22.8	63.1
110	608.589	0.173	0.21	74.9	1.01	102	82.8	0.091	12.17	0.044	22.5	62.8
111			0.22	74.9	1.03	-	82.6	0.090	11.76	0.041	22.4	62.2
112			0.21	74.9	0.99	-	82.6	0.090	11.67	0.045	22.5	62.2
113			0.20	74.9	1.00	-	82.5	0.090	11.55	0.041	22.3	62.1
114			0.23	74.9	1.00	-	82.5	0.089	11.25	0.035	22.3	61.7
115			0.21	74.9	1.09	-	82.4	0.089	11.31	0.032	22.4	61.9
116			0.19	74.9	1.07	-	82.3	0.090	11.77	0.062	22.5	62.2

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.20	74.9	1.20	-	82.1	0.090	12.21	0.096	22.5	62.1
118			0.20	74.9	1.32	-	82.1	0.090	12.29	0.093	22.2	61.9
119			0.19	74.8	1.45	-	82.1	0.089	11.87	0.070	21.9	61.3
120	610.320	0.173	0.20	74.8	1.51	102	82.0	0.088	11.33	0.028	21.8	60.8
121			0.23	74.8	1.59	-	82.2	0.088	10.92	0.020	21.6	60.4
122			0.20	74.8	1.62	-	82.5	0.087	10.63	0.015	21.7	60.1
123			0.21	74.8	1.75	-	82.8	0.086	10.51	0.020	21.7	59.9
124			0.21	74.8	1.73	-	83.0	0.086	10.29	0.021	21.8	59.5
125			0.22	74.7	1.91	-	83.3	0.086	10.17	0.015	21.8	59.4
126			0.21	74.8	2.13	-	83.5	0.086	10.23	0.020	21.7	59.2
127			0.22	74.8	2.27	-	83.8	0.085	10.21	0.015	21.7	59.0
128			0.23	74.8	2.36	-	84.0	0.085	10.10	0.009	21.7	58.8
129			0.23	74.9	2.49	-	84.2	0.084	9.99	0.008	21.7	58.6
130	612.059	0.174	0.24	74.9	2.57	102	84.5	0.085	9.76	(0.001)	21.6	58.3
131			0.23	74.9	2.55	-	84.6	0.083	9.43	(0.016)	21.5	57.7
132	612.407	0.174	0.22	74.9	2.63	102	84.8	0.083	8.98	(0.018)	21.3	57.4
Avg/Tot	22.704	0.172	0.24	74.6	1.22	100	84.1	0.077	8.55	0.189	29.10	59.693

This value is final DGM value - Initial DGM value - Volume increase recorded during mid-test leak check procedures (0.030 ft3)



## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 5

Technician: SJB

Date: 6/8/2023

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	218.299		0.40	73.9	1.00		85.7
1			0.40	74.0	1.00	-	85.3
2			0.40	73.9	1.00	-	85.2
3			0.40	74.0	1.00	-	85.2
4			0.40	74.0	1.00	-	85.1
5			0.40	74.0	1.00	-	85.1
6			0.40	74.0	1.00	-	85.1
7			0.40	74.0	1.00	-	85.2
8			0.40	74.1	1.00	-	85.3
9			0.40	74.0	1.00	-	85.3
10	219.912	0.161	0.40	74.1	1.00	104	85.4
11			0.40	74.1	1.00	-	85.5
12			0.40	74.1	1.00	-	85.6
13			0.40	74.2	1.00	-	85.7
14			0.40	74.2	1.00	-	85.9
15			0.40	74.2	1.00	-	86.0
16			0.40	74.2	1.00	-	86.3
17			0.40	74.2	1.00	-	86.4
18			0.40	74.2	1.00	-	86.4
19			0.40	74.2	1.00	-	86.4
20	221.476	0.156	0.40	74.2	1.00	103	86.4
21			0.40	74.2	1.00	-	86.5
22			0.40	74.3	1.00	-	86.4
23			0.40	74.3	1.00	-	86.5
24			0.40	74.3	1.00	-	86.4
25			0.40	74.3	1.00	-	86.3
26			0.40	74.3	1.00	-	86.2
27			0.40	74.3	1.00	-	86.1
28			0.40	74.3	1.00	-	86.2
29			0.40	74.4	1.00	-	86.1
30	223.077	0.160	0.40	74.4	1.00	106	86.1
31			0.40	74.4	1.00	-	86.1

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 5

Technician: SJB

Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data						
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.40	74.4	1.00	-	86.1
33			0.40	74.3	1.00	-	86.0
34			0.40	74.4	1.00	-	86.0
35			0.40	74.3	1.00	-	85.9
36			0.40	74.4	1.00	-	85.7
37			0.40	74.4	1.00	-	85.4
38			0.40	74.4	1.00	-	85.2
39			0.40	74.4	1.00	-	85.0
40	224.676	0.160	0.40	74.4	1.00	106	84.8
41			0.40	74.4	1.00	-	84.5
42			0.40	74.4	1.00	-	84.2
43			0.40	74.4	1.00	-	83.9
44			0.40	74.4	1.00	-	83.6
45			0.40	74.4	1.00	-	83.8
46			0.40	74.4	1.00	-	84.3
47			0.40	74.5	1.00	-	84.6
48			0.40	74.5	1.00	-	85.0
49			0.40	74.5	1.00	-	85.3
50	226.157	0.148	0.40	74.5	1.00	98	85.8
51			0.40	74.6	1.00	-	86.2
52			0.40	74.6	1.00	-	86.7
53			0.40	74.6	1.00	-	87.1
54			0.40	74.6	1.00	-	87.0
55			0.40	74.7	1.00	-	86.8
56			0.40	74.7	1.00	-	86.6
57			0.40	74.7	1.00	-	86.3
58			0.40	74.7	1.00	-	86.1
59			0.40	74.7	1.00	-	85.9
60	227.290	0.113	0.40	74.7	1.00	75	85.7
Avg/Tot	8.991	0.150	0.40	74.3	1.00	99	85.7

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
0	76.7	76.5	77.0	76.8	76.5	76.7	N/A	
1	86.7	76.5	77.0	76.8	76.5	78.7	N/A	
2	100.4	76.5	77.9	76.9	76.7	81.7	N/A	
3	112.7	76.6	79.7	77.2	77.1	84.7	N/A	
4	125.5	76.7	82.4	77.7	77.8	88.0	N/A	
5	138.5	76.8	85.8	78.5	78.8	91.7	N/A	
6	158.6	76.9	89.6	79.6	80.1	97.0	N/A	
7	200.2	77.0	93.9	80.9	81.7	106.7	N/A	
8	260.7	77.2	99.2	82.4	83.9	120.7	N/A	
9	315.4	77.5	105.6	84.2	86.5	133.8	N/A	
10	361.0	77.8	112.3	86.5	89.6	145.4	N/A	
11	394.1	78.3	119.1	89.2	93.0	154.8	N/A	
12	428.7	79.1	126.0	92.5	97.0	164.7	N/A	
13	465.4	80.0	132.8	96.2	101.3	175.1	N/A	
14	502.8	81.2	139.6	100.3	105.8	186.0	N/A	
15	532.9	82.7	146.6	105.0	110.5	195.5	N/A	
16	555.7	84.3	153.3	110.1	115.3	203.8	N/A	
17	579.7	86.4	160.2	115.7	120.3	212.5	N/A	
18	602.2	88.7	167.2	121.8	125.5	221.1	N/A	
19	621.4	91.5	174.7	128.0	130.6	229.3	N/A	
20	636.7	94.7	182.6	134.4	135.4	236.8	N/A	
21	651.1	98.2	190.9	140.9	139.8	244.2	N/A	
22	666.5	102.0	199.8	147.5	144.3	252.0	N/A	
23	679.4	106.1	209.1	154.3	149.4	259.7	N/A	
24	689.8	110.6	218.8	161.5	155.2	267.2	N/A	
25	693.9	115.2	228.8	168.7	161.8	273.7	N/A	
26	695.6	120.2	238.4	176.3	168.9	279.9	N/A	
27	695.0	125.3	247.7	184.5	176.4	285.8	N/A	
28	694.2	130.7	256.7	192.8	184.3	291.7	N/A	
29	688.9	136.3	265.6	201.1	192.4	296.8	N/A	
30	685.1	141.6	274.1	208.8	200.2	302.0	N/A	
31	682.5	147.1	282.2	217.1	208.2	307.4	N/A	
32	672.9	153.1	291.8	225.3	216.1	311.8	N/A	
33	639.3	159.5	302.3	233.2	223.9	311.6	N/A	
34	599.5	165.6	308.6	240.7	231.5	309.2	N/A	
35	562.2	171.5	310.2	247.6	238.6	306.0	N/A	
36	549.6	177.2	310.2	253.7	245.6	307.3	N/A	
37	562.0	182.1	309.5	259.4	252.3	313.0	N/A	
38	574.8	187.0	308.4	263.3	258.4	318.4	N/A	
39	582.3	191.3	306.9	267.0	264.2	322.3	N/A	
40	585.1	195.2	305.1	270.1	269.7	325.1	N/A	
41	584.9	198.8	303.3	272.7	274.8	326.9	N/A	
42	581.5	202.2	301.2	275.1	279.1	327.8	N/A	
43	573.5	205.4	299.0	277.1	283.2	327.6	N/A	
44	563.6	208.2	296.3	280.3	286.6	327.0	N/A	
45	551.3	211.1	293.6	281.3	289.0	325.3	N/A	
46	539.1	213.8	291.0	281.7	291.1	323.3	N/A	
47	527.0	215.8	288.1	282.5	292.5	321.2	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
48	517.3	217.5	285.2	282.2	293.4	319.1	N/A	
49	508.6	219.1	282.2	281.7	294.1	317.1	N/A	
50	500.8	220.5	279.3	280.8	295.1	315.3	N/A	
51	494.3	221.9	276.4	281.0	296.0	313.9	N/A	
52	488.4	223.0	273.9	280.9	297.1	312.7	N/A	
53	483.5	224.4	271.5	280.5	298.2	311.6	N/A	
54	478.8	225.6	269.3	279.9	299.4	310.6	N/A	
55	473.3	226.9	267.5	278.9	300.6	309.4	N/A	
56	468.1	228.4	265.8	277.8	301.6	308.3	N/A	
57	463.8	229.9	264.4	276.6	302.5	307.4	N/A	
58	459.1	231.3	263.2	275.5	303.6	306.5	N/A	
59	453.7	232.5	262.2	273.9	304.6	305.4	N/A	
60	448.8	233.4	261.1	272.6	305.7	304.3	N/A	
61	444.6	234.4	260.3	271.3	306.6	303.4	N/A	
62	440.2	235.3	259.6	269.9	307.4	302.5	N/A	
63	436.1	236.3	259.0	268.3	308.1	301.6	N/A	
64	432.7	237.4	258.6	267.0	308.7	300.9	N/A	
65	429.6	238.2	258.2	265.5	309.1	300.1	N/A	
66	427.8	239.2	257.9	264.0	309.4	299.7	N/A	
67	425.9	240.2	257.9	262.7	309.4	299.2	N/A	
68	423.6	241.1	257.9	261.4	309.2	298.6	N/A	
69	421.6	242.1	258.0	260.0	308.9	298.1	N/A	
70	420.2	243.2	258.3	258.6	308.7	297.8	N/A	
71	419.3	244.3	258.5	257.4	308.4	297.6	N/A	
72	419.1	245.3	258.8	256.2	308.0	297.5	N/A	
73	419.9	246.4	258.9	255.1	307.7	297.6	N/A	
74	421.2	247.3	259.0	254.1	307.4	297.8	N/A	
75	424.3	248.5	259.0	252.8	306.8	298.3	N/A	
76	430.9	249.6	258.8	251.7	306.2	299.4	N/A	
77	438.9	250.7	258.5	250.9	306.0	301.0	N/A	
78	454.0	251.8	258.4	250.1	305.8	304.0	N/A	
79	476.9	252.7	258.6	249.5	305.7	308.7	N/A	
80	511.1	254.3	259.4	249.1	305.6	315.9	N/A	
81	547.9	255.5	260.7	249.0	305.5	323.7	N/A	
82	584.0	256.9	262.5	249.4	305.6	331.7	N/A	
83	618.5	258.4	264.6	249.7	305.9	339.4	N/A	
84	647.5	260.0	267.1	250.7	306.4	346.3	N/A	
85	668.7	261.5	270.0	252.1	307.1	351.9	N/A	
86	684.8	263.4	273.2	253.9	308.1	356.7	N/A	
87	699.2	265.4	276.5	255.9	309.1	361.2	N/A	
88	712.9	267.4	280.0	258.5	310.5	365.9	N/A	
89	727.3	269.5	283.8	261.4	311.9	370.8	N/A	
90	741.5	272.0	287.6	264.6	313.5	375.9	N/A	
91	755.2	274.4	291.6	268.1	315.3	380.9	N/A	
92	769.1	276.7	295.8	271.6	317.4	386.1	N/A	
93	781.6	279.4	300.2	275.3	319.6	391.2	N/A	
94	790.5	281.2	305.1	278.5	321.3	395.3	N/A	
95	801.7	283.5	309.7	281.9	323.4	400.0	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-161Model: 1.7RTracking #: 135Run #: 5Technician: SJBDate: 6/8/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
96	810.9	286.1	314.1	285.5	325.7	404.5	N/A	
97	818.4	287.9	318.6	289.4	328.3	408.5	N/A	
98	824.7	290.1	323.2	292.9	331.1	412.4	N/A	
99	829.9	292.3	327.8	296.8	334.0	416.2	N/A	
100	833.3	294.6	332.4	300.8	337.1	419.7	N/A	
101	835.7	296.6	337.2	304.6	340.5	422.9	N/A	
102	835.6	299.0	341.7	308.5	344.0	425.7	N/A	
103	833.9	301.5	346.3	312.5	347.5	428.3	N/A	
104	831.2	303.7	350.9	316.4	350.9	430.6	N/A	
105	829.4	306.0	355.4	320.3	354.4	433.1	N/A	
106	828.2	308.4	359.7	323.7	357.9	435.6	N/A	
107	828.7	311.1	364.1	327.8	361.4	438.6	N/A	
108	828.8	313.2	368.5	332.2	364.7	441.5	N/A	
109	829.3	315.6	372.9	336.5	368.0	444.5	N/A	
110	828.6	318.3	377.0	340.6	371.1	447.1	N/A	
111	825.6	320.3	381.3	345.3	374.3	449.4	N/A	
112	822.1	323.0	385.5	349.4	377.3	451.4	N/A	
113	818.6	325.6	389.5	353.9	380.2	453.6	N/A	
114	814.4	327.6	393.8	358.3	383.0	455.4	N/A	
115	811.2	330.0	398.0	363.3	385.7	457.6	N/A	
116	810.4	332.6	402.1	368.3	388.2	460.3	N/A	
117	810.6	335.1	406.3	372.8	390.8	463.1	N/A	
118	811.6	337.5	410.8	376.9	393.1	466.0	N/A	
119	810.4	340.3	415.6	381.4	395.4	468.6	N/A	
120	807.2	343.3	420.6	386.0	397.6	470.9	N/A	
121	802.1	346.2	425.8	389.8	399.8	472.7	N/A	
122	795.3	349.0	430.9	392.9	401.9	474.0	N/A	
123	788.3	351.8	435.8	396.8	404.1	475.4	N/A	
124	781.4	354.4	440.8	400.1	406.4	476.6	N/A	
125	776.0	357.3	446.0	402.7	408.5	478.1	N/A	
126	769.8	359.6	450.9	405.2	410.5	479.2	N/A	
127	765.4	363.6	455.8	407.8	412.7	481.1	N/A	
128	761.1	366.4	460.7	411.2	414.7	482.8	N/A	
129	756.6	369.5	465.5	413.4	416.8	484.4	N/A	
130	752.0	372.5	470.3	415.7	418.5	485.8	N/A	
131	746.6	375.6	475.1	417.5	420.5	487.1	N/A	
132	740.0	378.8	479.6	419.6	422.2	488.0	N/A	
Average	596.4	226.2	281.8	256.2	277.0	328	N/A	

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0166 / H0172	371.7	379.7	8.0
	<b>B</b>	H0167 / H0173	372.2	379.7	7.5
	<b>C - 1st Hour</b>	H0168	178.4	181.2	2.8
	<b>Amb</b>	H0156	95.6	95.6	0.0
<b>Probes</b>	<b>A</b>	8A	116633.0	116633.1	0.1
	<b>B</b>	8B	116664.9	116664.9	0.0
	<b>C - 1st Hour</b>	8C	116662.5	116662.6	0.1
<b>O-rings</b>	<b>A</b>	8A	3551.3	3551.9	0.6
	<b>B</b>	8B	3357.2	3357.6	0.4
	<b>C - 1st Hour</b>	8C	3586.2	3586.4	0.2

**Placed in Dessicator on:** 6/12 - 10:30

**Balance Audit (mg):** 100.0 100.0 100.0 100.0

*Undesiccated                      Dessicated                      Dessicated                      Dessicated*

<b>Filters</b>	<b>A</b>	183.6/196.1	6/8 - 11:10 / 6/8 - 12:30	379.7	6/14 10:47	379.7	6/15 12:34	
	<b>B</b>	184.0/196.0	6/8 - 11:10 / 6/8 - 12:30	379.6	6/14 10:47	379.7	6/15 12:34	
	<b>C - 1st Hour</b>	181.5	6/8 11:10	181.3	6/14 10:47	181.2	6/15 12:34	
	<b>Amb</b>	95.5	6/8 12:31	95.6	6/14 10:48	95.6	6/15 12:35	
<b>Probes</b>	<b>A</b>			116632.9	6/14 10:56	116633.1	6/15 12:46	
	<b>B</b>			116665.0	6/14 10:57	116664.9	6/15 12:46	
	<b>C - 1st Hour</b>			116662.6	6/14 10:57	116662.6	6/15 12:46	
<b>O-Rings</b>	<b>A</b>			3551.8	6/14 10:36	3551.9	6/15 12:24	
	<b>B</b>			3357.4	6/14 10:36	3357.6	6/15 12:24	
	<b>C - 1st Hour</b>			3586.3	6/14 10:37	3586.4	6/15 12:24	

<b>Train A Aggregate, mg:</b>	<b>8.7</b>
<b>Train B Aggregate, mg:</b>	<b>7.9</b>
<b>Train C Aggregate, mg:</b>	<b>3.1</b>
<b>Ambient Aggregate, mg:</b>	<b>0.0</b>

## ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
 Model: 1.7R Run Number: 6 Test Date: 6/8/2023

### Wood Heater Run Notes

#### High Fire Test Notes

Test Burn Start Time: 14:35  
 Air Control Setting: Fully Open

Time	Notes
14:35	Light newspaper on top of kindling with torch (10 seconds) left door open
14:38	Door closed, fan off, air set to high (fully open)
15:14	@ 1.88 lbs, leveled coal bed and loaded high fire test load, door left open
15:16	Closed door, fan turned on to max speed
16:42	Ended test at 3.28 lbs (1.88 lbs coal bed + 1.40 lbs of high fire load) remaining

Test Burn End Time: 16:42

#### Low/Medium Fire Test Notes

Test Burn Start Time: N/A  
 Air Control Setting: N/A

Time	Notes

Test Burn End Time: N/A

### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 18.00 CO (%): 4.35  
 Mid Gas CO<sub>2</sub> (%): 10.10 CO (%): 1.98

#### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:40	8:45	8:43	8:20	8:15	8:25
CO <sub>2</sub>	0.00	10.02	18.01	0.02	9.98	18.11
CO	0.000	1.967	4.352	-0.009	1.956	4.324

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

Technician Signature: 

Date: 6/9/2023

# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 6 Test Date: 6/8/2023

## Test Photos



**Kindling Fuel Load**



**Start-up Fuel Load**



**Kindling & Start-up Loaded in Stove**



**High Fire Fuel Load**

Technician Signature: *Sebastian E. Sutton*

Date: 6/9/2023



# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 6 Test Date: 6/8/2023



**Residual Start-up Fuel Coal Bed – Pre Rake**



**Residual Start-up Fuel Coal Bed – Post Rake**



**High Fire Fuel Loaded**



**Air Setting – High Fire**

Technician Signature: *Sebastian E. Sutton*

Date: 6/9/2023

**WOOD STOVE TEST DATA PACKET**  
**ASTM E3053/E2515**



**Run 6 Data Summary**

Client: SBI  
Model: 1.7R  
Job #: 23-161  
Tracking #: 135  
Test Date: 6/8/2023

A handwritten signature in dark ink, appearing to read "Sebastian E. [unclear]". The signature is written in a cursive style.

\_\_\_\_\_  
Technician Signature

7/3/2023

\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI

Model: 1.7R

Run #: 6

Job #: 23-161

Tracking #: 135

Technician: SJB

Date: 6/8/2023

<b>Burn Rate (kg/hr):</b>	<b>3.46</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	20.757	18.366	18.001	7.605
Average Gas Velocity in Dilution Tunnel (ft/sec)	24.78			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	28352.0			
Average Gas Meter Temperature (°F)	81.1	76.5	74.9	75.7
Total Sample Volume (dscf)	20.204	18.302	17.893	7.402
Average Tunnel Temperature (°F)	101.1			
Total Time of Test (min)	127			
Total Particulate Catch (mg)	0.1	2.1	2.4	1.7
Particulate Concentration, dry-standard (g/dscf)	0.0000049	0.0001147	0.0001341	0.0002297
Total PM Emissions (g)	0.30	6.59	7.75	6.37
Particulate Emission Rate (g/hr)	0.14	3.11	3.66	6.37
Emissions Factor (g/kg)	-	0.94	1.11	-
Difference from Average Total Particulate Emissions (g)	-	0.58	0.58	-
Difference from Average Total Particulate Emissions (%)	-	8.1%	8.1%	-
Difference from Average Emissions Factor (g/kg)	-	0.08	0.08	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	7.17
Particulate Emission Rate (g/hr)	3.39
Emissions Factor (g/kg)	1.03
HHV Efficiency (%)	65.1%
LHV Efficiency (%)	69.7%
CO Emissions (g/min)	2.83

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 81.8/Max: 87.7	OK
Face Velocity	< 30 ft/min	8.2	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min:74.4/Max:88	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 06/08/23  
**Run:** 6  
**Control #:** 23-161  
**Test Duration:** 87  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	65.1%	69.7%
<b>Combustion Efficiency</b>	96.7%	96.7%
<b>Heat Transfer Efficiency</b>	67.3%	72.1%

<b>Output Rate (kJ/h)</b>	43,225	41,004	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	3.53	7.79	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	66,440	63,025	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	5.12	11.29	<b>dry lb</b>
<b>MC wet (%)</b>	17.26		
<b>MC dry (%)</b>	20.86		
<b>Particulate (g )</b>	7.17		
<b>CO (g)</b>	246		
<b>Test Duration (h)</b>	1.45		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.11	3.93
<b>g/kg Dry Fuel</b>	1.40	48.04
<b>g/h</b>	4.95	169.79
<b>g/min</b>	0.08	2.83
<b>lb/MM Btu Output</b>	0.27	9.13

<b>Air/Fuel Ratio (A/F)</b>	12.72
-----------------------------	-------

VERSION:

2.4

4/15/2010

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking # 135  
 Technician: SJB  
 Date: 6/8/2023

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 3.01  
 Max Allowable Start-up Fuel Weight (lbs): 4.51

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	2.90	In Range	16.0	21.9	23.1	20.3	In Range	2.41	1.09
2	15.75	2.60	In Range	21.4	25.5	15.7	20.9	In Range	2.15	0.98
3	15.75	3.16	In Range	21.0	25.5	18.2	21.6	In Range	2.60	1.18
Core Load Wt. (lbs)		8.66	In Range							

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	2.40	In Range	23.8	18.7	21.0	21.2	In Range	1.98	0.90
2	15.75	3.98	In Range	24.2	18.3	19.0	20.5	In Range	3.31	1.50
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.39	In Range							

Total Load Weight (lbs): 15.05 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: 104% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.4  
 Total Load Average Moisture Content (%DB): 20.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.3  
 Total Test Load Weight (dry basis): 12.45 lbs 5.65 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.98	In Range	10	10	10	10.0	In Range	2.71	1.23

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.25	In Range	19.2	24.6	19.5	21.1	In Range	3.51	1.59

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 3.0  
 Actual Residual Start-up Fuel Weight (lb): 1.88 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.4 to 1.7 lb  
 Actual Fuel Load Ending Weight (lb): 1.40 In Range

Total Weight All Fuel Added: 22.28 lbs, wet basis  
 18.67 lbs, dry basis  
 8.47 kg, dry basis

Total Weight All Fuel Burned (dry basis): 15.39 lbs  
 6.98 kg

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6  
 Test Start Time: 14:45  
 Test Type: High Fire

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Recording Interval (min): 1  
 Total Sampling Time (min): 127  
 High Fire Test Load Time (min): 40

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 6/5/2023  
 Test Fuel Scale Audit (kg): 5.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.58	29.54	29.56
Relative Humidity (%)	38.6	37.9	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Platform Scale Audit (kg)	5.0	5.0	
Ambient Sample Volume:	20.757		ft <sup>3</sup>

### Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.001	0.001	cfm @	-5 in. Hg
(B)	0.001	0.002	cfm @	-5 in. Hg
(C)	0.001	0.000	cfm @	-5 in. Hg
(Ambient)	0.001	0.000	cfm @	-5 in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.126	74
2	0.151	74
3	0.152	74
4	0.132	74
5	0.101	74
6	0.141	74
7	0.151	74
8	0.136	74
Center	0.157	74

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

$V_{strav}$ : 24.71 ft/sec  
 $V_{scnt}$ : 26.57 ft/sec  
 $F_p$ : 0.930 [ratio]  
 Initial Tunnel Flow: 495.1 scf/min

Static Pressure: -0.323 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI \_\_\_\_\_  
Model: 1.7R \_\_\_\_\_  
Run #: 6 \_\_\_\_\_

Job #: 23-161 \_\_\_\_\_  
Tracking #: 135 \_\_\_\_\_  
Technician: SJB \_\_\_\_\_  
Date: 6/8/2023 \_\_\_\_\_

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

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	539.595		0.158	1.01	75.3	0.00		7.32		78.5	83.5	84.0	80.9
1			0.154	0.84	76.0	0.55	-	7.28	-0.05	80.6	114.0	83.8	81.4
2			0.154	0.94	76.0	0.56	-	7.22	-0.06	82.2	140.7	83.4	82.1
3			0.154	0.88	76.0	0.57	-	7.13	-0.09	84.7	168.3	83.2	83.0
4			0.156	0.90	76.1	0.58	-	7.01	-0.12	81.5	210.4	83.1	82.1
5			0.156	0.84	76.1	0.59	-	6.92	-0.09	81.6	251.5	82.8	82.3
6			0.154	0.89	76.2	0.60	-	6.82	-0.10	81.8	277.7	82.4	82.1
7			0.155	0.88	76.2	0.59	-	6.74	-0.09	82.2	292.9	81.8	82.2
8			0.155	0.86	76.2	0.61	-	6.64	-0.10	82.6	302.5	81.9	82.9
9			0.154	0.91	76.2	0.61	-	6.52	-0.12	83.8	335.2	82.5	83.5
10	541.040	0.144	0.153	0.93	76.2	0.62	97	6.38	-0.14	85.3	373.9	83.0	82.6
11			0.154	0.86	76.2	0.64	-	6.25	-0.13	86.1	394.3	83.4	82.2
12			0.152	0.89	76.3	0.65	-	6.13	-0.12	86.7	409.0	83.9	82.1
13			0.153	0.89	76.3	0.64	-	6.02	-0.12	87.1	413.3	84.5	82.9
14			0.154	0.86	76.3	0.65	-	5.90	-0.12	87.5	415.3	85.0	82.8
15			0.153	0.89	76.3	0.67	-	5.78	-0.12	88.0	417.5	85.4	82.5
16			0.153	0.93	76.3	0.66	-	5.64	-0.14	88.7	431.1	85.8	82.4
17			0.154	0.90	76.3	0.67	-	5.50	-0.15	89.6	446.3	86.1	82.4
18			0.152	0.91	76.3	0.67	-	5.35	-0.15	90.8	467.5	86.4	82.6
19			0.152	0.91	76.3	0.67	-	5.16	-0.18	92.5	494.5	87.0	82.4
20	542.467	0.143	0.152	0.82	76.3	0.68	97	4.96	-0.20	93.7	513.6	87.5	82.9
21			0.152	0.91	76.4	0.67	-	4.79	-0.17	94.0	516.6	87.7	83.3
22			0.151	0.86	76.4	0.69	-	4.63	-0.17	94.3	516.6	87.3	83.8
23			0.151	0.91	76.4	0.68	-	4.45	-0.18	94.9	519.0	87.2	83.9
24			0.152	0.86	76.4	0.68	-	4.27	-0.18	95.6	527.3	86.9	83.9
25			0.152	0.90	76.4	0.67	-	4.08	-0.19	96.1	532.4	86.6	84.3
26			0.152	0.81	76.3	0.68	-	3.93	-0.15	96.0	530.0	86.4	84.1
27			0.151	0.82	76.3	0.70	-	3.74	-0.19	96.6	535.1	86.1	84.5
28			0.151	0.78	76.4	0.69	-	3.55	-0.19	97.7	551.2	86.1	84.8
29			0.151	0.74	76.4	0.69	-	3.36	-0.19	98.6	567.6	85.9	85.2
30	543.893	0.143	0.151	0.81	76.4	0.71	98	3.17	-0.19	99.6	580.1	85.8	85.3
31			0.150	0.78	76.4	0.71	-	2.99	-0.19	100.0	584.1	85.7	85.7
32			0.150	0.73	76.5	0.71	-	2.81	-0.17	100.2	580.9	85.6	86.1



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.150	0.68	76.4	0.72	-	2.64	-0.17	103.8	579.7	85.3	84.6
34			0.150	0.72	76.4	0.71	-	2.49	-0.15	103.7	580.2	85.1	83.2
35			0.150	0.70	76.5	0.72	-	2.36	-0.13	104.4	578.0	85.0	84.3
36			0.150	0.66	76.5	0.73	-	2.21	-0.15	105.0	571.8	84.8	84.1
37			0.150	0.67	76.4	0.72	-	2.09	-0.12	105.4	563.0	84.5	84.7
38			0.149	0.67	76.4	0.73	-	1.97	-0.12	105.3	553.9	84.3	84.2
39			0.149	0.72	76.4	0.72	-	1.88	-0.09	104.4	541.2	84.1	84.4
40	545.320	0.143	0.144	0.72	76.3	0.72	101	16.93	15.05	133.0	557.0	85.2	86.2
41			0.142	0.75	76.4	0.73	-	16.44	-0.49	142.6	573.3	85.9	87.4
42			0.146	0.74	76.4	0.74	-	16.11	-0.33	126.4	618.3	86.0	87.1
43			0.147	0.75	76.4	0.77	-	15.87	-0.24	112.2	606.0	85.1	88.0
44			0.146	0.77	76.4	0.78	-	15.58	-0.28	113.3	612.5	84.8	84.8
45			0.148	0.77	76.4	0.77	-	15.36	-0.23	112.0	621.3	84.5	83.8
46			0.148	0.77	76.4	0.77	-	15.14	-0.21	111.2	629.0	84.4	83.9
47			0.147	0.78	76.4	0.78	-	14.91	-0.23	111.1	630.9	84.1	83.5
48			0.146	0.77	76.4	0.78	-	14.68	-0.23	111.5	629.1	84.0	84.4
49			0.149	0.81	76.4	0.78	-	14.43	-0.25	112.6	626.6	84.0	85.4
50	546.758	0.144	0.147	0.82	76.4	0.78	103	14.20	-0.23	113.3	623.7	84.0	85.8
51			0.147	0.82	76.5	0.79	-	13.98	-0.22	114.1	622.3	83.9	86.0
52			0.147	0.82	76.4	0.78	-	13.73	-0.24	114.7	621.2	84.0	86.3
53			0.148	0.80	76.4	0.79	-	13.50	-0.23	114.8	620.1	83.9	86.4
54			0.147	0.82	76.5	0.79	-	13.27	-0.23	115.1	619.2	83.9	86.7
55			0.147	0.83	76.5	0.80	-	13.04	-0.23	115.2	626.6	83.9	84.7
56			0.146	0.85	76.5	0.80	-	12.81	-0.23	114.9	634.8	83.9	84.2
57			0.146	0.87	76.5	0.79	-	12.59	-0.23	114.7	644.0	83.8	84.4
58			0.145	0.87	76.5	0.81	-	12.32	-0.27	114.5	657.1	83.8	83.4
59			0.147	0.89	76.5	0.81	-	12.05	-0.27	115.0	668.4	83.8	82.3
60	548.187	0.143	0.146	0.88	76.5	0.82	101	11.79	-0.26	115.3	680.3	83.7	81.7
61			0.146	0.89	76.5	0.81	-	11.51	-0.28	115.4	690.0	83.8	81.4
62			0.147	0.88	76.4	0.81	-	11.24	-0.27	115.7	700.4	83.8	81.3
63			0.146	0.91	76.5	0.82	-	10.97	-0.27	115.9	709.8	83.7	80.6
64			0.146	0.92	76.5	0.81	-	10.69	-0.27	116.3	716.6	83.6	80.7
65			0.145	0.92	76.5	0.82	-	10.42	-0.27	115.9	720.3	83.6	80.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.145	0.92	76.5	0.84	-	10.16	-0.26	115.3	724.0	83.7	80.7
67			0.147	0.94	76.6	0.85	-	9.88	-0.28	115.1	727.8	83.6	80.9
68			0.147	0.92	76.6	0.85	-	9.63	-0.26	114.8	732.4	83.6	81.6
69			0.147	0.94	76.6	0.84	-	9.36	-0.27	114.6	734.6	83.6	82.0
70	549.590	0.140	0.147	0.93	76.7	0.86	99	9.10	-0.27	114.6	734.9	83.5	81.4
71			0.146	0.94	76.7	0.87	-	8.85	-0.24	114.0	731.7	83.6	81.9
72			0.146	0.93	76.7	0.85	-	8.62	-0.24	113.5	726.9	83.7	81.1
73			0.146	0.97	76.7	0.87	-	8.38	-0.24	112.9	721.9	83.7	81.2
74			0.147	0.96	76.6	0.85	-	8.18	-0.19	112.4	716.6	83.8	81.1
75			0.147	1.00	76.6	0.86	-	7.97	-0.22	112.1	714.1	83.8	81.1
76			0.148	0.99	76.7	0.86	-	7.74	-0.22	111.7	710.3	83.9	81.2
77			0.148	0.94	76.6	0.87	-	7.55	-0.19	111.1	700.6	84.1	81.0
78			0.148	0.97	76.7	0.88	-	7.36	-0.19	110.2	691.8	84.1	80.5
79			0.149	0.99	76.7	0.89	-	7.18	-0.18	109.7	679.9	84.2	80.7
80	550.982	0.139	0.147	0.97	76.8	0.87	98	7.01	-0.18	108.7	666.0	84.1	80.9
81			0.149	0.99	76.8	0.88	-	6.83	-0.17	108.1	656.8	84.1	80.8
82			0.149	0.99	76.7	0.90	-	6.69	-0.14	107.2	649.5	84.2	80.2
83			0.149	1.02	76.7	0.90	-	6.52	-0.17	106.8	642.5	84.1	80.3
84			0.149	0.99	76.7	0.90	-	6.35	-0.17	106.2	636.5	84.2	80.4
85			0.149	1.01	76.6	0.93	-	6.22	-0.13	105.6	627.8	84.2	80.5
86			0.150	1.00	76.7	0.91	-	6.07	-0.15	104.9	616.6	84.2	80.1
87			0.149	1.01	76.7	0.93	-	5.92	-0.15	104.0	605.7	84.2	80.0
88			0.149	1.01	76.7	0.93	-	5.83	-0.09	103.1	593.2	84.1	79.8
89			0.150	1.04	76.7	0.93	-	5.73	-0.10	102.2	579.7	84.1	79.9
90	552.405	0.142	0.151	1.01	76.7	0.93	99	5.63	-0.10	101.3	568.5	84.0	79.3
91			0.150	1.01	76.7	0.90	-	5.55	-0.08	100.8	560.0	84.0	79.2
92			0.151	1.01	76.6	0.91	-	5.45	-0.10	100.2	552.4	83.9	79.0
93			0.151	1.01	76.6	0.93	-	5.35	-0.10	99.7	545.4	83.9	79.2
94			0.151	1.03	76.6	0.94	-	5.27	-0.08	99.0	539.8	83.8	79.2
95			0.151	1.02	76.6	0.93	-	5.19	-0.08	98.7	534.3	83.8	78.6
96			0.150	1.01	76.6	0.95	-	5.09	-0.10	98.2	530.4	83.8	78.2
97			0.152	1.01	76.7	0.93	-	5.02	-0.08	98.0	527.2	83.7	77.5
98			0.151	1.03	76.7	0.95	-	4.92	-0.10	97.7	524.6	83.7	77.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.151	1.02	76.6	0.92	-	4.82	-0.09	97.5	522.1	83.7	77.9
100	553.861	0.146	0.151	1.03	76.7	0.93	100	4.77	-0.05	97.1	518.7	83.7	77.7
101			0.152	1.02	76.7	0.93	-	4.69	-0.08	96.8	515.6	83.7	77.7
102			0.152	1.03	76.7	0.91	-	4.58	-0.11	96.3	512.1	83.6	77.0
103			0.151	1.02	76.7	0.97	-	4.52	-0.06	95.9	506.3	83.6	76.9
104			0.152	1.01	76.7	0.95	-	4.45	-0.07	95.5	500.2	83.5	77.0
105			0.152	1.00	76.7	0.96	-	4.40	-0.05	95.1	494.6	83.4	77.3
106			0.152	1.00	76.7	0.95	-	4.32	-0.08	94.7	489.2	83.4	76.9
107			0.152	0.99	76.7	0.94	-	4.24	-0.08	94.3	483.8	83.3	76.5
108			0.153	1.00	76.7	0.97	-	4.19	-0.05	94.1	481.6	83.2	76.4
109			0.153	0.99	76.7	0.96	-	4.12	-0.07	93.8	478.2	83.1	76.4
110	555.350	0.149	0.153	0.99	76.7	0.95	102	4.06	-0.05	93.6	474.1	83.0	76.5
111			0.152	0.97	76.7	0.96	-	4.01	-0.06	93.2	469.7	83.0	76.3
112			0.152	0.99	76.7	0.96	-	3.96	-0.05	92.8	464.7	82.9	76.3
113			0.152	0.98	76.7	1.00	-	3.89	-0.07	92.4	460.1	82.9	75.6
114			0.152	0.98	76.7	0.97	-	3.83	-0.06	92.2	455.2	82.8	75.4
115			0.154	0.98	76.7	0.98	-	3.81	-0.03	91.9	450.2	82.8	75.5
116			0.154	0.99	76.8	0.99	-	3.74	-0.07	91.5	446.6	82.7	75.7
117			0.154	0.98	76.8	0.99	-	3.69	-0.05	91.2	442.8	82.7	75.3
118			0.153	0.97	76.8	0.98	-	3.64	-0.05	91.1	439.6	82.6	75.3
119			0.154	1.01	76.9	0.98	-	3.59	-0.05	90.8	436.8	82.5	75.6
120	556.883	0.153	0.153	1.02	76.9	0.99	104	3.55	-0.04	90.7	435.1	82.4	75.5
121			0.154	0.98	76.9	0.98	-	3.50	-0.05	90.4	433.3	82.4	75.2
122			0.154	0.97	76.9	0.98	-	3.47	-0.04	90.4	431.5	82.4	75.0
123			0.154	0.98	76.8	0.97	-	3.42	-0.05	90.2	430.1	82.3	75.0
124			0.153	0.95	76.8	0.97	-	3.39	-0.03	90.2	429.8	82.3	75.2
125			0.154	0.98	76.8	0.99	-	3.32	-0.07	89.9	429.2	82.2	74.7
126			0.154	0.97	76.8	0.97	-	3.28	-0.04	89.7	428.7	82.2	74.6
127	557.961	0.154	0.154	0.97	76.9	0.98	104	3.28	0.00	89.4	426.2	82.1	74.4
Avg/Tot	18.366	0.145	0.150	0.91	76.5	0.81	101			101.1	537.6	84.1	81.1

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	612.426		0.08	74.3	0.00		84.4	0.003	0.00	(0.040)	38.5	50.4
1			0.11	74.6	0.44	-	84.4	0.025	0.69	(0.029)	38.4	52.5
2			0.10	74.6	0.59	-	84.2	0.028	1.23	(0.022)	37.7	53.2
3			0.11	74.6	0.60	-	84.0	0.042	1.22	(0.014)	37.2	54.5
4			0.10	74.6	0.45	-	84.1	0.046	3.54	0.011	39.3	53.6
5			0.09	74.6	0.52	-	83.9	0.052	5.11	0.038	41.3	55.2
6			0.10	74.7	0.49	-	83.6	0.055	5.03	0.029	41.2	55.2
7			0.11	74.7	0.55	-	83.3	0.053	5.36	0.049	41.1	55.4
8			0.12	74.7	0.49	-	83.0	0.058	4.69	0.050	40.5	55.2
9			0.11	74.7	0.52	-	82.9	0.064	6.19	0.034	41.0	56.8
10	613.850	0.142	0.12	74.7	0.62	97	82.6	0.068	7.53	0.067	40.5	57.7
11			0.12	74.7	0.53	-	82.5	0.070	7.06	0.028	39.4	57.6
12			0.15	74.8	0.59	-	82.5	0.070	7.27	(0.006)	38.8	57.9
13			0.14	74.8	0.64	-	82.5	0.071	6.48	0.011	37.7	57.4
14			0.15	74.7	0.65	-	82.4	0.071	6.32	0.045	37.5	57.6
15			0.14	74.8	0.65	-	82.2	0.071	6.28	0.025	36.9	57.6
16			0.16	74.8	0.63	-	82.2	0.074	6.99	0.030	37.3	58.5
17			0.15	74.8	0.66	-	82.1	0.075	7.78	0.044	37.0	59.0
18			0.16	74.8	0.54	-	81.9	0.081	7.69	0.045	36.5	59.4
19			0.16	74.8	0.54	-	82.2	0.083	8.98	0.092	36.4	61.0
20	615.248	0.140	0.18	74.8	0.63	97	82.2	0.082	10.42	0.183	36.0	61.7
21			0.18	74.9	0.65	-	82.4	0.082	9.53	0.126	34.8	61.0
22			0.18	74.9	0.65	-	82.5	0.082	9.09	0.147	34.1	60.8
23			0.19	74.8	0.56	-	82.7	0.083	9.18	0.109	33.6	61.0
24			0.19	74.9	0.68	-	82.7	0.083	9.65	0.103	33.7	61.5
25			0.20	74.9	0.68	-	82.8	0.082	9.77	0.154	33.3	61.7
26			0.20	74.9	0.58	-	83.0	0.084	9.78	0.058	32.8	61.2
27			0.20	74.9	0.58	-	83.0	0.085	9.69	0.114	32.6	61.3
28			0.20	74.9	0.57	-	83.2	0.087	10.41	0.188	32.3	62.1
29			0.21	74.9	0.64	-	83.3	0.088	10.95	0.266	31.7	62.4
30	616.650	0.140	0.20	74.9	0.59	98	83.5	0.089	10.81	0.381	30.9	62.4
31			0.23	74.9	0.57	-	83.5	0.087	10.92	0.308	30.3	62.2
32			0.21	74.9	0.59	-	83.6	0.087	10.53	0.212	29.6	62.1
33			0.24	74.9	0.70	-	83.4	0.087	10.17	0.152	27.4	62.8
34			0.24	74.9	0.66	-	83.2	0.087	9.71	0.101	26.6	61.9
35			0.26	74.9	0.70	-	83.2	0.086	9.69	0.113	26.1	61.7
36			0.25	74.8	0.62	-	83.0	0.085	9.58	0.044	25.4	61.5
37			0.27	74.8	0.66	-	83.0	0.084	9.27	0.030	24.9	61.2
38			0.28	74.8	0.61	-	82.8	0.083	8.95	0.071	24.6	60.8

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.28	74.8	0.69	-	82.7	0.082	8.27	0.124	24.2	60.3
40	618.052	0.140	0.28	74.7	0.60	101	82.7	0.091	5.15	0.077	24.7	61.0
41			0.30	74.7	0.61	-	82.7	0.105	3.89	0.299	24.7	61.0
42			0.28	74.7	0.61	-	82.8	0.092	6.96	0.453	24.7	61.0
43			0.30	74.7	0.62	-	82.9	0.091	11.89	0.888	25.1	67.6
44			0.30	74.8	0.63	-	82.9	0.092	11.93	0.865	25.2	68.5
45			0.32	74.8	0.65	-	82.8	0.093	11.87	0.777	25.2	67.6
46			0.31	74.8	0.70	-	82.8	0.092	12.00	0.654	25.5	67.1
47			0.30	74.8	0.71	-	82.7	0.093	11.77	0.626	25.4	66.9
48			0.31	74.8	0.70	-	82.6	0.093	11.51	0.553	25.2	66.7
49			0.31	74.8	0.66	-	82.5	0.091	11.38	0.488	24.5	66.7
50	619.455	0.140	0.35	74.8	0.72	103	82.5	0.092	11.09	0.490	24.0	66.7
51			0.36	74.8	0.71	-	82.4	0.091	11.05	0.549	23.6	66.9
52			0.32	74.8	0.74	-	82.4	0.091	10.88	0.584	23.4	67.1
53			0.32	74.8	0.67	-	82.5	0.092	10.95	0.600	23.2	67.1
54			0.33	74.8	0.65	-	82.5	0.092	10.94	0.645	23.1	67.1
55			0.34	74.8	0.65	-	82.3	0.094	11.29	0.652	23.1	67.5
56			0.34	74.8	0.75	-	82.4	0.094	11.63	0.769	23.4	67.6
57			0.34	74.8	0.72	-	82.3	0.094	11.96	0.762	23.7	67.6
58			0.35	74.8	0.66	-	82.3	0.096	12.25	0.878	24.0	67.8
59			0.35	74.8	0.76	-	82.2	0.096	12.62	0.954	23.8	68.0
60	620.860	0.140	0.37	74.8	0.66	102	82.2	0.096	12.85	0.948	23.8	68.4
61			0.39	74.8	0.70	-	82.2	0.098	12.90	0.961	23.9	68.5
62			0.38	74.8	0.72	-	82.2	0.098	13.03	0.971	23.7	68.5
63			0.39	74.8	0.70	-	82.2	0.099	13.22	0.898	23.5	68.4
64			0.40	74.8	0.66	-	82.0	0.099	13.26	0.934	23.4	68.5
65			0.37	74.8	0.66	-	82.1	0.099	13.30	0.905	23.3	68.2
66			0.38	74.8	0.74	-	82.1	0.099	13.39	0.856	23.5	68.0
67			0.40	74.8	0.75	-	82.0	0.099	13.45	0.832	23.7	68.0
68			0.39	74.9	0.69	-	82.0	0.100	13.72	0.858	23.7	68.0
69			0.39	74.9	0.75	-	82.1	0.100	13.93	0.760	23.6	67.6
70	622.229	0.137	0.40	74.9	0.78	99	82.0	0.099	13.91	0.605	23.4	67.3
71			0.39	74.9	0.75	-	82.2	0.100	13.79	0.560	23.6	66.9
72			0.35	74.9	0.73	-	82.2	0.099	13.71	0.462	23.5	66.6
73			0.38	74.9	0.78	-	82.4	0.100	13.61	0.471	23.5	66.0
74			0.37	74.9	0.71	-	82.6	0.098	12.93	0.541	23.4	65.5
75			0.35	74.9	0.78	-	82.6	0.098	12.66	0.581	23.4	65.1
76			0.33	74.9	0.80	-	82.7	0.097	12.60	0.646	23.3	64.9
77			0.34	74.9	0.81	-	82.8	0.097	12.21	0.474	23.2	64.2

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.29	74.9	0.72	-	83.1	0.096	12.00	0.366	23.5	64.0
79			0.39	74.9	0.74	-	83.0	0.095	11.65	0.281	23.3	63.5
80	623.600	0.137	0.34	74.9	0.81	99	83.2	0.092	11.07	0.206	23.4	62.4
81			0.33	74.9	0.73	-	83.2	0.092	10.74	0.238	23.6	62.2
82			0.35	74.9	0.82	-	83.4	0.091	10.61	0.249	23.8	61.7
83			0.36	74.9	0.76	-	83.4	0.090	10.40	0.222	23.7	61.3
84			0.35	74.8	0.80	-	83.5	0.091	10.19	0.208	23.9	61.2
85			0.39	74.8	0.81	-	83.6	0.090	10.25	0.223	23.9	60.6
86			0.37	74.8	0.75	-	83.6	0.089	9.89	0.088	24.0	60.1
87			0.39	74.9	0.85	-	83.8	0.087	9.48	0.040	24.1	59.5
88			0.40	74.9	0.82	-	83.8	0.086	8.98	0.024	24.1	58.6
89			0.31	75.0	0.85	-	83.9	0.085	8.03	0.033	24.0	57.9
90	624.986	0.139	0.26	75.0	0.75	98	84.0	0.083	7.68	0.031	24.2	57.4
91			0.33	75.0	0.85	-	84.1	0.083	7.54	0.033	24.3	57.0
92			0.31	74.9	0.83	-	84.1	0.083	7.52	0.032	24.7	57.0
93			0.30	74.9	0.80	-	84.1	0.083	7.46	0.030	24.8	56.7
94			0.34	74.9	0.83	-	84.1	0.081	7.45	0.031	25.1	56.5
95			0.27	74.9	0.86	-	84.0	0.082	7.36	0.032	25.3	56.3
96			0.28	75.0	0.85	-	84.2	0.082	7.35	0.026	25.6	56.1
97			0.29	75.0	0.86	-	84.1	0.081	7.29	0.025	25.7	56.1
98			0.30	75.0	0.87	-	84.0	0.081	7.36	0.031	25.9	56.1
99			0.26	75.0	0.77	-	84.0	0.080	7.40	0.028	25.9	55.9
100	626.417	0.143	0.26	75.0	0.86	101	84.1	0.080	7.26	0.036	26.0	55.8
101			0.29	75.0	0.79	-	84.1	0.080	7.13	0.042	26.2	55.8
102			0.29	75.0	0.82	-	84.1	0.080	7.17	0.039	26.6	55.6
103			0.27	75.1	0.80	-	84.1	0.078	6.97	0.039	26.7	55.4
104			0.29	75.1	0.85	-	84.2	0.078	6.77	0.040	26.9	55.2
105			0.23	75.1	0.81	-	84.0	0.077	6.65	0.039	26.9	55.0
106			0.24	75.0	0.86	-	84.0	0.077	6.51	0.045	27.1	54.9
107			0.25	75.0	0.83	-	84.1	0.076	6.40	0.049	27.3	54.7
108			0.22	75.0	0.81	-	84.1	0.077	6.36	0.035	27.5	54.7
109			0.22	75.1	0.88	-	84.0	0.076	6.27	0.029	27.6	54.5
110	627.877	0.146	0.22	75.1	0.79	102	84.0	0.075	6.20	0.031	27.6	54.5
111			0.19	75.1	0.79	-	84.0	0.075	6.05	0.042	27.7	54.1
112			0.22	75.1	0.87	-	83.9	0.074	5.83	0.043	27.8	54.0
113			0.24	75.2	0.83	-	83.9	0.074	5.70	0.061	27.7	53.6
114			0.22	75.2	0.91	-	83.9	0.073	5.59	0.080	27.8	53.4
115			0.22	75.2	0.86	-	83.9	0.072	5.52	0.081	27.9	53.2
116			0.21	75.2	0.85	-	83.8	0.072	5.45	0.080	28.1	53.2

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.21	75.2	0.91	-	83.8	0.072	5.43	0.083	28.2	53.1
118			0.23	75.2	0.83	-	83.7	0.071	5.38	0.083	28.3	53.1
119			0.23	75.3	0.85	-	83.7	0.071	5.38	0.082	28.5	53.1
120	629.375	0.150	0.24	75.3	0.89	104	83.7	0.071	5.44	0.081	28.6	53.1
121			0.23	75.3	0.81	-	83.6	0.071	5.43	0.080	28.9	52.9
122			0.23	75.2	0.91	-	83.6	0.071	5.43	0.081	29.0	53.1
123			0.23	75.2	0.83	-	83.5	0.071	5.48	0.076	29.1	53.1
124			0.24	75.3	0.83	-	83.5	0.071	5.53	0.075	29.2	53.1
125			0.25	75.2	0.85	-	83.3	0.071	5.58	0.066	29.4	53.1
126			0.26	75.2	0.90	-	83.4	0.070	5.54	0.052	29.5	52.9
127	630.427	0.150	0.25	75.2	0.89	104	83.4	0.070	5.14	0.073	29.2	52.5
Avg/Tot	18.001	0.142	0.26	74.9	0.71	101	83.1	0.082	8.74	0.261	28.17	60.174

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 6

Technician: SJB

Date: 6/8/2023

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	227.339		0.40	75.3	1.00		86.8
1			0.40	75.4	1.00	-	86.9
2			0.40	75.4	1.00	-	86.6
3			0.40	75.4	1.00	-	86.3
4			0.40	75.4	1.00	-	86.1
5			0.40	75.4	1.00	-	85.8
6			0.40	75.4	1.00	-	85.3
7			0.40	75.4	1.00	-	84.8
8			0.40	75.4	1.00	-	84.5
9			0.40	75.4	1.00	-	84.4
10	228.574	0.124	0.40	75.5	1.00	94	84.4
11			0.40	75.5	1.00	-	84.4
12			0.40	75.5	1.00	-	84.5
13			0.40	75.6	1.00	-	84.5
14			0.40	75.5	1.00	-	84.6
15			0.40	75.6	1.00	-	84.6
16			0.40	75.6	1.00	-	84.7
17			0.40	75.6	1.00	-	84.7
18			0.40	75.6	1.00	-	84.7
19			0.40	75.6	1.00	-	85.0
20	229.835	0.126	0.40	75.6	1.00	98	85.5
21			0.40	75.7	1.00	-	85.8
22			0.40	75.7	1.00	-	85.9
23			0.40	75.7	1.00	-	86.0
24			0.40	75.7	1.00	-	86.1
25			0.40	75.7	1.00	-	86.2
26			0.40	75.7	1.00	-	86.3
27			0.40	75.7	1.00	-	86.4
28			0.40	75.7	1.00	-	86.6
29			0.40	75.7	1.00	-	86.7
30	231.121	0.129	0.40	75.7	1.00	101	86.9
31			0.40	75.8	1.00	-	87.0



## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 6

Technician: SJB

Date: 6/8/2023

Elapsed Time (min)	Particulate Sampling Data						
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.40	75.8	1.00	-	87.1
33			0.40	75.8	1.00	-	87.0
34			0.40	75.8	1.00	-	86.8
35			0.40	75.8	1.00	-	86.6
36			0.40	75.8	1.00	-	86.4
37			0.40	75.8	1.00	-	86.2
38			0.40	75.8	1.00	-	86.0
39			0.40	75.9	1.00	-	85.8
40	232.402	0.128	0.40	75.8	1.00	104	86.3
41			0.40	75.8	1.00	-	86.8
42			0.40	75.9	1.00	-	87.0
43			0.40	75.9	1.00	-	86.4
44			0.40	75.9	1.00	-	86.2
45			0.40	75.9	1.00	-	86.0
46			0.40	75.9	1.00	-	85.8
47			0.40	75.9	1.00	-	85.7
48			0.40	75.9	1.00	-	85.5
49			0.40	75.9	1.00	-	85.5
50	233.678	0.128	0.40	75.9	1.00	104	85.4
51			0.40	75.9	1.00	-	85.4
52			0.40	75.9	1.00	-	85.3
53			0.40	76.0	1.00	-	85.2
54			0.40	75.9	1.00	-	85.2
55			0.40	76.0	1.00	-	85.1
56			0.40	76.0	1.00	-	85.1
57			0.40	76.0	1.00	-	85.0
58			0.40	76.0	1.00	-	85.0
59			0.40	76.0	1.00	-	84.9
60	234.944	0.127	0.40	76.0	1.00	102	84.9
Avg/Tot	7.605	0.127	0.40	75.7	1.00	101	85.7

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	82.6	86.2	85.1	85.5	83.8	84.6	N/A
1	89.5	86.1	85.1	85.4	83.8	86.0	N/A
2	100.6	85.9	85.3	85.5	83.8	88.2	N/A
3	110.2	85.9	86.2	85.5	84.0	90.4	N/A
4	129.1	85.9	88.1	85.7	84.4	94.7	N/A
5	161.1	85.8	91.0	86.2	85.1	101.8	N/A
6	195.5	85.7	94.6	87.0	85.9	109.7	N/A
7	228.1	85.7	98.7	88.2	87.1	117.5	N/A
8	251.0	85.7	103.2	89.6	88.5	123.6	N/A
9	281.4	85.9	108.1	91.5	90.4	131.5	N/A
10	320.1	86.2	113.8	93.8	92.5	141.3	N/A
11	353.0	86.5	120.0	96.4	94.9	150.1	N/A
12	385.2	87.0	126.7	99.4	97.6	159.2	N/A
13	411.6	87.7	133.6	102.9	100.6	167.3	N/A
14	435.3	88.4	140.3	106.8	103.9	174.9	N/A
15	452.4	89.2	146.8	111.0	107.5	181.4	N/A
16	468.8	90.3	153.1	115.6	111.2	187.8	N/A
17	488.5	91.5	159.3	120.5	115.1	195.0	N/A
18	511.4	92.9	165.4	125.7	119.1	202.9	N/A
19	540.3	94.5	171.2	131.0	123.2	212.1	N/A
20	570.6	96.4	177.0	136.6	127.5	221.6	N/A
21	591.4	98.6	183.5	142.3	131.9	229.6	N/A
22	606.8	101.3	190.5	148.3	136.7	236.7	N/A
23	620.1	104.2	197.8	154.2	141.8	243.6	N/A
24	631.5	107.4	205.2	160.3	147.3	250.4	N/A
25	643.5	111.0	212.6	166.3	153.2	257.3	N/A
26	652.3	114.8	219.8	172.3	159.4	263.7	N/A
27	658.3	118.8	226.7	178.4	165.9	269.6	N/A
28	669.0	123.0	233.6	184.6	172.8	276.6	N/A
29	686.5	127.3	240.3	190.9	179.8	285.0	N/A
30	705.2	131.9	247.1	197.4	187.1	293.7	N/A
31	723.9	136.5	254.0	203.9	194.5	302.5	N/A
32	738.8	141.4	261.1	210.2	202.2	310.7	N/A
33	751.5	146.1	268.4	215.9	209.5	318.3	N/A
34	760.1	150.9	275.7	221.7	217.0	325.1	N/A
35	768.3	156.2	282.9	228.0	224.5	332.0	N/A
36	773.4	161.9	290.4	234.5	231.9	338.4	N/A
37	773.2	167.8	298.1	240.9	239.3	343.9	N/A
38	767.7	174.0	305.9	247.0	246.3	348.2	N/A
39	756.5	180.0	313.9	253.2	253.1	351.4	N/A
40	738.6	186.8	323.3	260.9	260.2	354.0	N/A
41	710.2	193.7	333.4	268.5	266.9	354.5	N/A
42	705.7	200.4	339.3	275.1	273.2	358.7	N/A
43	714.9	207.0	340.1	281.6	279.5	364.6	N/A
44	722.8	212.6	338.8	287.0	284.6	369.2	N/A
45	733.7	217.6	336.5	291.6	289.7	373.8	N/A
46	743.9	221.8	334.4	295.8	294.3	378.1	N/A
47	750.3	225.8	332.5	299.3	298.9	381.4	N/A

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
48	755.9	229.9	331.1	303.5	303.9	384.9	N/A	
49	757.5	233.7	330.3	307.4	308.4	387.5	N/A	
50	758.1	237.5	329.8	311.0	312.6	389.8	N/A	
51	757.7	241.1	329.6	314.3	316.6	391.9	N/A	
52	758.5	244.5	329.7	317.4	320.4	394.1	N/A	
53	758.3	247.9	329.9	320.2	323.8	396.0	N/A	
54	757.8	250.8	330.4	323.0	327.0	397.8	N/A	
55	757.2	253.4	331.0	324.5	329.4	399.1	N/A	
56	760.0	256.0	331.5	326.6	331.8	401.2	N/A	
57	765.7	257.6	332.1	327.6	333.2	403.2	N/A	
58	772.0	259.4	332.8	328.8	334.4	405.5	N/A	
59	779.7	261.7	333.7	330.5	335.7	408.3	N/A	
60	787.3	263.5	334.8	332.0	337.3	411.0	N/A	
61	795.9	265.6	336.3	333.4	338.9	414.0	N/A	
62	804.6	267.5	338.0	334.9	340.8	417.2	N/A	
63	812.8	269.5	340.0	336.6	342.9	420.4	N/A	
64	821.1	271.4	342.1	338.6	345.3	423.7	N/A	
65	826.4	273.6	344.6	340.6	348.2	426.7	N/A	
66	834.6	275.4	347.2	342.4	350.4	430.0	N/A	
67	840.1	277.7	350.0	344.5	353.1	433.1	N/A	
68	848.6	280.2	352.8	347.3	356.5	437.1	N/A	
69	856.9	282.9	355.8	349.7	359.4	440.9	N/A	
70	865.7	285.4	359.0	352.1	362.2	444.9	N/A	
71	874.0	287.8	362.6	354.5	365.0	448.8	N/A	
72	880.1	290.3	366.2	357.2	368.2	452.4	N/A	
73	884.9	292.6	369.9	359.5	371.3	455.7	N/A	
74	886.2	295.1	373.8	362.3	374.2	458.3	N/A	
75	886.4	297.3	377.7	364.8	377.2	460.7	N/A	
76	883.4	299.8	381.7	367.4	380.2	462.5	N/A	
77	884.1	302.2	385.5	370.4	383.4	465.1	N/A	
78	881.3	304.1	389.3	373.3	386.1	466.8	N/A	
79	878.7	306.4	393.1	376.0	389.1	468.7	N/A	
80	872.5	308.8	396.8	379.1	391.6	469.8	N/A	
81	863.9	311.4	400.7	382.1	394.4	470.5	N/A	
82	852.1	313.7	404.5	385.0	396.9	470.4	N/A	
83	840.6	316.2	408.1	388.0	399.2	470.4	N/A	
84	831.1	318.4	411.6	390.2	401.5	470.6	N/A	
85	820.4	320.6	415.2	392.8	403.9	470.6	N/A	
86	812.2	323.1	418.7	395.2	405.8	471.0	N/A	
87	801.8	325.4	422.0	397.5	407.6	470.8	N/A	
88	792.1	327.5	424.9	399.5	409.3	470.7	N/A	
89	779.3	329.5	427.5	401.5	410.5	469.7	N/A	
90	767.3	331.8	429.6	403.1	411.5	468.7	N/A	
91	754.0	333.1	431.1	404.9	412.8	467.2	N/A	
92	743.4	335.1	432.2	406.4	413.5	466.1	N/A	
93	734.0	336.8	433.0	407.8	413.9	465.1	N/A	
94	723.9	338.0	433.5	408.4	413.8	463.5	N/A	
95	714.3	339.2	433.9	409.5	413.7	462.1	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
96	705.6	340.5	434.0	410.1	413.5	460.7	N/A	
97	697.9	341.4	434.0	410.8	413.2	459.5	N/A	
98	690.5	342.5	434.0	411.3	412.4	458.1	N/A	
99	685.0	343.2	434.0	411.3	411.4	457.0	N/A	
100	679.1	344.4	433.9	411.9	410.7	456.0	N/A	
101	673.1	344.6	433.7	411.5	409.8	454.5	N/A	
102	667.7	345.4	433.4	411.4	408.7	453.3	N/A	
103	662.4	346.2	433.3	411.3	407.9	452.2	N/A	
104	657.2	346.9	433.5	411.1	407.2	451.2	N/A	
105	651.4	347.4	434.0	410.8	406.1	450.0	N/A	
106	645.2	348.1	434.4	411.0	405.3	448.8	N/A	
107	638.4	348.8	435.0	410.8	404.3	447.5	N/A	
108	632.5	349.5	435.4	410.4	403.5	446.3	N/A	
109	625.5	350.5	435.7	410.6	402.8	445.0	N/A	
110	619.9	350.9	435.5	410.4	401.9	443.7	N/A	
111	614.4	351.3	435.4	410.3	400.8	442.5	N/A	
112	608.3	351.6	435.2	409.9	400.1	441.0	N/A	
113	601.2	352.5	435.0	410.1	399.4	439.6	N/A	
114	595.4	352.9	434.7	409.8	398.6	438.3	N/A	
115	587.9	353.8	434.2	409.6	397.9	436.7	N/A	
116	581.3	354.4	433.7	408.9	397.2	435.1	N/A	
117	576.1	355.0	433.1	408.2	396.5	433.8	N/A	
118	569.8	355.8	432.5	407.5	395.6	432.2	N/A	
119	564.9	356.1	431.8	406.3	394.8	430.8	N/A	
120	560.5	356.3	431.0	405.3	393.8	429.4	N/A	
121	555.3	356.8	430.1	404.5	392.5	427.8	N/A	
122	551.1	357.2	429.3	403.3	391.6	426.5	N/A	
123	548.6	357.4	428.4	402.3	390.7	425.5	N/A	
124	545.3	357.7	427.7	401.1	389.4	424.2	N/A	
125	543.4	358.3	427.0	399.9	388.2	423.3	N/A	
126	541.4	358.5	426.4	398.9	387.1	422.5	N/A	
127	539.4	358.4	426.0	398.0	385.8	421.5	N/A	
Average	657.5	243.5	325.5	300.0	299.4	365	N/A	

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/8/2023

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0169	179.0	180.9	1.9
	<b>B</b>	H0170	180.0	182.0	2.0
	<b>C - 1st Hour</b>	H0171	192.4	193.8	1.4
	<b>Amb</b>	H0157	96.5	96.6	0.1
<b>Probes</b>	<b>A</b>	9A	116530.0	116530.0	0.0
	<b>B</b>	9B	117737.7	117738.1	0.4
	<b>C - 1st Hour</b>	9C	116603.0	116603.2	0.2
<b>O-rings</b>	<b>A</b>	9A	3580.6	3580.8	0.2
	<b>B</b>	9B	3523.5	3523.5	0.0
	<b>C - 1st Hour</b>	9C	3430.7	3430.8	0.1

**Placed in Dessicator on:** 6/12 - 10:30

**Balance Audit (mg):** 100.0 100.0 100.0 100.0  
*Undessicated                      Dessicated                      Dessicated                      Dessicated*

<b>Filters</b>	<b>A</b>	180.8	6/8 17:05	181.0	6/14 10:48	180.9	6/15 12:35		
	<b>B</b>	181.8	6/8 17:05	182.1	6/14 10:48	182.0	6/15 12:36		
	<b>C - 1st Hour</b>	193.7	6/8 15:47	193.7	6/14 10:48	193.8	6/15 12:36		
	<b>Amb</b>	96.6	6/8 17:08	96.6	6/14 10:49	96.6	6/15 12:36		
<b>Probes</b>	<b>A</b>			116530.1	6/14 10:57	116530.0	6/15 12:47		
	<b>B</b>			117737.9	6/14 10:58	117738.3	6/15 12:47	117738.1	6/16 8:58
	<b>C - 1st Hour</b>			116603.1	6/14 10:58	116603.2	6/15 12:48		
<b>O-Rings</b>	<b>A</b>			3580.6	6/14 10:37	3580.8	6/15 12:25		
	<b>B</b>			3523.4	6/14 10:38	3523.5	6/15 12:25		
	<b>C - 1st Hour</b>			3430.7	6/14 10:38	3430.8	6/15 12:25		

<b>Train A Aggregate, mg:</b>	<b>2.1</b>
<b>Train B Aggregate, mg:</b>	<b>2.4</b>
<b>Train C Aggregate, mg:</b>	<b>1.7</b>
<b>Ambient Aggregate, mg:</b>	<b>0.1</b>

## ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
 Model: 1.7R Run Number: 7 Test Date: 6/9/2023

### Wood Heater Run Notes

**High Fire Test Notes**

Test Burn Start Time: 9:38  
 Air Control Setting: Fully Open

Time	Notes
9:38	Light newspaper on top of kindling with torch (10 seconds) left door open Door closed, fan off, air set to high (fully open) @ 1.88 lbs, leveled coal bed and loaded high fire test load, door left open Closed door, fan turned on to max speed Ended test at 3.21 lbs (1.87 lbs coal bed + 1.34 lbs of high fire load) remaining
9:41	
10:10	
10:13	
11:30	

Test Burn End Time: 11:30

**Low/Medium Fire Test Notes**

Test Burn Start Time: N/A  
 Air Control Setting: N/A

Time	Notes

Test Burn End Time: N/A

### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 18.00 CO (%): 4.35  
 Mid Gas CO<sub>2</sub> (%): 10.10 CO (%): 1.98

**Calibration Results:**

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:31	8:50	8:36	15:55	15:50	16:00
CO <sub>2</sub>	0.00	10.28	18.01	0.008	9.99	17.95
CO	0.000	2.041	4.352	-0.009	1.948	4.316

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

Technician Signature: 

Date: 6/13/2023

# ASTM E3053 Wood Heater Run Sheets

Client: SBI  
Model: 1.7R

Job Number: 23-161  
Run Number: 7

Tracking #: 135  
Test Date: 6/9/2023

## Test Photos



**Kindling Fuel Load**



**Start-up Fuel Load**



**Kindling & Start-up Loaded in Stove**



**High Fire Fuel Load**

Technician Signature: \_\_\_\_\_

*Sebastian E. Collins*

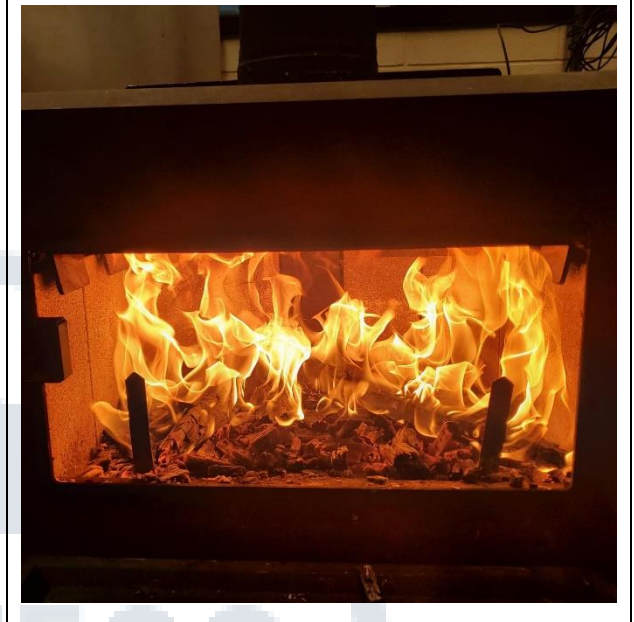
Date: 6/13/2023

# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 7 Test Date: 6/9/2023



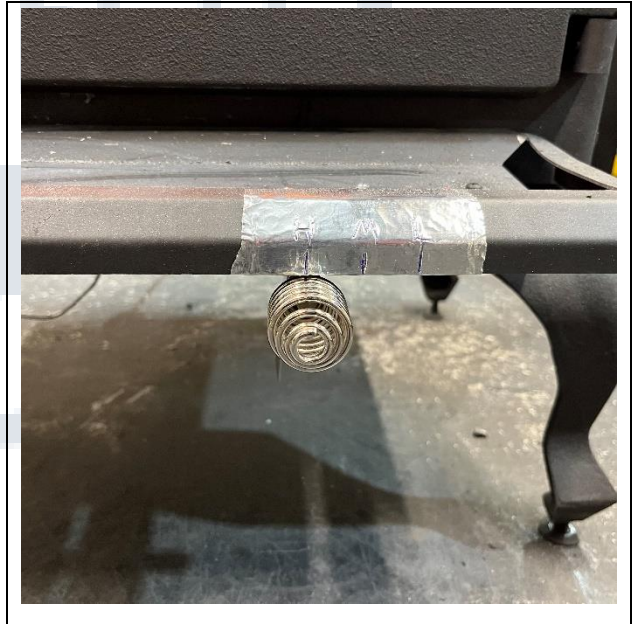
**Residual Start-up Fuel Coal Bed – Pre Rake**



**Residual Start-up Fuel Coal Bed – Post Rake**



**High Fire Fuel Loaded**



**Air Setting – High Fire**

Technician Signature: *Sebastian Sutton*

Date: 6/13/2023



**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 7 Data Summary**

Client: SBI  
Model: 1.7R  
Job #: 23-161  
Tracking #: 135  
Test Date: 6/9/2023

A handwritten signature in black ink, appearing to read "Sebastian E. ...".

\_\_\_\_\_  
Technician Signature

7/3/2023

\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI

Model: 1.7R

Run #: 7

Job #: 23-161

Tracking #: 135

Technician: SJB

Date: 6/9/2023

<b>Burn Rate (kg/hr):</b>	<b>3.79</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	18.507	16.013	15.654	7.733
Average Gas Velocity in Dilution Tunnel (ft/sec)	25.05			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	28609.9			
Average Gas Meter Temperature (°F)	81.0	74.8	73.5	73.7
Total Sample Volume (dscf)	18.036	16.024	15.616	7.563
Average Tunnel Temperature (°F)	102.7			
Total Time of Test (min)	112			
Total Particulate Catch (mg)	0.0	2.8	3.1	2.0
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0001747	0.0001985	0.0002644
Total PM Emissions (g)	0.00	9.33	10.60	7.57
Particulate Emission Rate (g/hr)	0.00	5.00	5.68	7.57
Emissions Factor (g/kg)	-	1.37	1.55	-
Difference from Average Total Particulate Emissions (g)	-	0.63	0.63	-
Difference from Average Total Particulate Emissions (%)	-	6.4%	6.4%	-
Difference from Average Emissions Factor (g/kg)	-	0.09	0.09	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	9.97
Particulate Emission Rate (g/hr)	5.34
Emissions Factor (g/kg)	1.46
HHV Efficiency (%)	65.1%
LHV Efficiency (%)	69.7%
CO Emissions (g/min)	3.31

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: 82.1/Max: 87.1	OK
Face Velocity	< 30 ft/min	8.1	OK
Leakage Rate	Less than 4% of average sample rate	0.003 cfm	OK
Ambient Temp	55-90 °F	Min:76.3/Max:88.1	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 06/09/23  
**Run:** 7  
**Control #:** 23-161  
**Test Duration:** 79  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	65.1%	69.7%
<b>Combustion Efficiency</b>	96.4%	96.4%
<b>Heat Transfer Efficiency</b>	67.5%	72.3%

<b>Output Rate (kJ/h)</b>	47,383	44,947	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	3.87	8.53	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	72,780	69,040	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	5.10	11.23	<b>dry lb</b>
<b>MC wet (%)</b>	16.71		
<b>MC dry (%)</b>	20.06		
<b>Particulate (g )</b>	9.97		
<b>CO (g)</b>	262		
<b>Test Duration (h)</b>	1.32		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.16	4.19
<b>g/kg Dry Fuel</b>	1.96	51.33
<b>g/h</b>	7.57	198.72
<b>g/min</b>	0.13	3.31
<b>lb/MM Btu Output</b>	0.37	9.75

<b>Air/Fuel Ratio (A/F)</b>	11.77
-----------------------------	-------

VERSION:

2.4

4/15/2010

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking # 135  
 Technician: SJB  
 Date: 6/9/2023

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.96  
 Max Allowable Start-up Fuel Weight (lbs): 4.45

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	2.90	In Range	17.5	24.3	16.6	19.5	In Range	2.42	1.10
2	16.00	3.17	In Range	20.5	24.4	17.1	20.7	In Range	2.62	1.19
3	16.00	2.52	In Range	23.1	19.0	21.7	21.3	In Range	2.08	0.94
Core Load Wt. (lbs)		8.58	In Range							

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	3.77	In Range	18.7	18.6	21.4	19.6	In Range	3.16	1.43
2	15.75	2.47	In Range	16.6	21.0	21.0	19.5	In Range	2.06	0.94
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.24	In Range							

Total Load Weight (lbs): 14.82 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: 103% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.3  
 Total Load Average Moisture Content (%DB): 20.1 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.7  
 Total Test Load Weight (dry basis): 12.35 lbs 5.60 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.91	In Range	10	10	10	10.0	In Range	2.65	1.20

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
3.98	In Range	25.2	21.1	16.9	21.1	In Range	3.29	1.49

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 3.0  
 Actual Residual Start-up Fuel Weight (lb): 1.88 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.3 to 1.63 lb  
 Actual Fuel Load Ending Weight (lb): 1.34 In Range

Total Weight All Fuel Added: 21.72 lbs, wet basis  
 18.28 lbs, dry basis  
 8.29 kg, dry basis

Total Weight All Fuel Burned (dry basis): 15.06 lbs  
 6.83 kg

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 7  
 Test Start Time: 9:38  
 Test Type: High Fire

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Recording Interval (min): 1  
 Total Sampling Time (min): 112  
 High Fire Test Load Time (min): 33

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 6/5/2023  
 Test Fuel Scale Audit (kg): 5.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.62	29.56	29.59
Relative Humidity (%)	40.8	40.6	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Platform Scale Audit (kg)	5.0	5.0	

Ambient Sample Volume: 18.507 ft<sup>3</sup>

### Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.001	0.000	cfm @	-5 in. Hg
(B)	0.002	0.003	cfm @	-5 in. Hg
(C)	0.000	0.000	cfm @	-5 in. Hg
(Ambient)	0.001	0.000	cfm @	-5 in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.121	80
2	0.145	80
3	0.148	79
4	0.136	79
5	0.107	77
6	0.142	77
7	0.148	77
8	0.132	77
Center	0.151	80

Dilution Tunnel H<sub>2</sub>O: 2.00 percent

Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 24.68 ft/sec

V<sub>scent</sub>: 26.19 ft/sec

F<sub>p</sub>: 0.942 [ratio]

Initial Tunnel Flow: 491.2 scf/min

Static Pressure: -0.319 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 7

Job #: 23-161  
Tracking #: 135  
Technician: SJB  
Date: 6/9/2023

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

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	558.165		0.156	0.67	73.5	0.00		6.99		77.5	82.3	83.7	78.2
1			0.153	0.66	74.1	0.58	-	6.91	-0.07	82.0	127.5	84.2	78.5
2			0.154	0.66	74.2	0.59	-	6.85	-0.06	83.4	154.3	84.6	78.7
3			0.154	0.68	74.2	0.57	-	6.77	-0.08	85.2	175.2	85.1	79.1
4			0.154	0.68	74.2	0.58	-	6.60	-0.17	84.2	231.2	85.3	78.8
5			0.153	0.71	74.2	0.60	-	6.47	-0.13	84.6	307.4	85.8	78.4
6			0.153	0.71	74.3	0.62	-	6.29	-0.19	86.1	369.6	86.1	78.8
7			0.153	0.69	74.3	0.65	-	6.11	-0.17	87.6	415.7	86.4	79.1
8			0.152	0.71	74.3	0.67	-	5.95	-0.16	87.9	426.7	86.7	79.4
9			0.152	0.72	74.3	0.66	-	5.79	-0.16	88.6	439.6	87.1	79.6
10	559.602	0.144	0.152	0.71	74.4	0.68	98	5.61	-0.19	90.0	462.9	87.1	79.8
11			0.152	0.73	74.4	0.68	-	5.45	-0.16	90.0	465.8	86.5	80.0
12			0.152	0.73	74.4	0.68	-	5.28	-0.17	90.8	474.0	85.9	80.2
13			0.153	0.69	74.5	0.69	-	5.07	-0.21	92.4	502.2	85.4	80.4
14			0.152	0.68	74.4	0.70	-	4.86	-0.21	93.9	526.8	85.1	80.7
15			0.152	0.73	74.4	0.70	-	4.67	-0.19	94.3	532.4	84.8	81.0
16			0.152	0.74	74.4	0.70	-	4.50	-0.18	95.5	530.1	84.4	80.7
17			0.150	0.74	74.5	0.70	-	4.34	-0.15	94.6	519.3	84.1	81.0
18			0.151	0.72	74.5	0.70	-	4.18	-0.16	94.2	510.7	83.7	81.4
19			0.150	0.72	74.5	0.69	-	4.01	-0.17	94.6	515.5	83.8	81.9
20	561.035	0.143	0.150	0.74	74.4	0.68	99	3.82	-0.19	95.7	530.3	83.7	82.2
21			0.151	0.75	74.5	0.69	-	3.61	-0.20	96.5	543.8	83.6	82.6
22			0.149	0.73	74.4	0.71	-	3.42	-0.19	97.2	551.9	83.6	83.0
23			0.151	0.77	74.4	0.70	-	3.20	-0.21	97.8	562.6	83.6	83.3
24			0.150	0.77	74.4	0.70	-	3.00	-0.20	99.5	571.6	83.6	83.5
25			0.149	0.77	74.5	0.71	-	2.81	-0.19	99.3	574.1	83.6	83.6
26			0.149	0.76	74.5	0.71	-	2.62	-0.19	99.0	572.7	83.7	84.1
27			0.150	0.77	74.5	0.71	-	2.47	-0.15	99.0	564.5	83.7	84.5
28			0.150	0.79	74.5	0.72	-	2.32	-0.15	98.5	554.3	83.8	84.6
29			0.150	0.78	74.5	0.71	-	2.19	-0.13	98.2	544.5	83.7	84.9
30	562.450	0.142	0.150	0.77	74.6	0.71	98	2.07	-0.12	98.1	537.1	83.7	85.1
31			0.151	0.80	74.5	0.71	-	1.96	-0.11	101.5	527.4	83.7	83.3
32			0.150	0.80	74.5	0.70	-	1.87	-0.08	100.9	516.5	83.8	82.8

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.142	0.80	74.5	0.71	-	16.70	14.83	134.4	541.4	85.1	84.1
34			0.141	0.82	74.5	0.76	-	16.29	-0.41	137.0	499.5	85.7	85.7
35			0.140	0.85	74.6	0.76	-	15.96	-0.33	144.5	522.5	86.5	85.0
36			0.145	0.87	74.7	0.77	-	15.64	-0.33	129.9	579.6	86.4	85.4
37			0.147	0.88	74.7	0.78	-	15.43	-0.20	114.8	568.8	85.7	85.7
38			0.147	0.91	74.7	0.79	-	15.23	-0.20	111.0	562.7	85.4	85.3
39			0.148	0.89	74.8	0.78	-	15.06	-0.17	108.7	559.0	85.4	84.9
40	563.871	0.142	0.149	0.88	74.8	0.78	99	14.87	-0.19	104.6	555.5	85.1	85.6
41			0.149	0.92	74.9	0.79	-	14.69	-0.18	103.1	552.8	85.1	86.6
42			0.148	0.91	74.8	0.81	-	14.48	-0.21	102.9	553.8	85.1	87.2
43			0.150	0.95	74.9	0.80	-	14.29	-0.19	103.4	556.3	84.9	87.8
44			0.149	0.97	74.8	0.82	-	14.07	-0.22	104.6	561.3	84.9	88.1
45			0.148	0.95	74.8	0.81	-	13.89	-0.18	109.4	568.2	85.1	86.9
46			0.148	0.94	74.8	0.81	-	13.69	-0.19	110.5	575.2	85.2	85.7
47			0.148	0.97	74.8	0.82	-	13.53	-0.16	111.1	584.3	85.1	85.8
48			0.147	0.98	74.8	0.82	-	13.31	-0.22	112.2	596.0	85.3	85.6
49			0.149	0.96	74.8	0.83	-	13.10	-0.21	113.1	605.7	85.3	85.7
50	565.307	0.144	0.147	0.96	74.9	0.85	101	12.91	-0.20	112.0	612.9	85.3	85.1
51			0.147	1.00	74.9	0.84	-	12.69	-0.22	111.5	618.5	85.3	84.7
52			0.147	1.00	74.8	0.85	-	12.47	-0.21	111.3	623.7	85.1	85.2
53			0.147	0.98	74.9	0.88	-	12.25	-0.22	111.6	631.5	85.0	85.3
54			0.147	1.00	74.9	0.88	-	12.02	-0.23	111.9	639.7	84.8	84.6
55			0.146	1.02	74.9	0.89	-	11.75	-0.27	112.7	655.1	84.8	84.0
56			0.146	1.03	74.9	0.88	-	11.48	-0.27	114.5	685.0	84.8	81.6
57			0.145	1.01	74.9	0.91	-	11.20	-0.29	116.0	713.2	84.7	80.8
58			0.146	1.02	74.9	0.92	-	10.88	-0.32	116.1	735.6	84.8	80.5
59			0.146	1.03	74.9	0.91	-	10.59	-0.30	116.1	751.2	84.7	80.2
60	566.718	0.141	0.145	1.05	75.0	0.92	101	10.27	-0.31	116.0	761.7	84.6	80.0
61			0.146	1.03	75.0	0.92	-	9.97	-0.31	116.2	761.5	84.7	79.8
62			0.146	1.06	74.9	0.94	-	9.66	-0.30	115.9	752.9	84.8	79.8
63			0.146	1.06	74.9	0.93	-	9.37	-0.30	115.2	746.5	84.7	80.3
64			0.145	1.07	75.0	0.94	-	9.07	-0.30	115.0	744.7	84.6	80.6
65			0.147	1.09	75.0	0.94	-	8.79	-0.28	114.7	742.9	84.5	79.5



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.146	1.12	75.0	0.95	-	8.50	-0.29	114.6	739.4	84.4	79.4
67			0.145	1.11	75.0	0.95	-	8.23	-0.26	114.0	734.3	84.3	78.8
68			0.147	1.11	75.0	0.95	-	7.98	-0.25	113.3	729.0	84.3	80.5
69			0.146	1.11	75.0	0.96	-	7.74	-0.24	112.7	721.0	84.2	79.7
70	568.099	0.138	0.147	1.13	75.0	1.03	99	7.53	-0.21	111.6	712.6	84.1	79.6
71			0.147	1.09	75.0	1.03	-	7.33	-0.20	111.0	707.0	84.1	79.7
72			0.147	1.10	75.0	1.03	-	7.09	-0.24	110.5	704.4	84.1	79.9
73			0.147	1.13	75.0	1.03	-	6.88	-0.21	110.3	701.5	84.1	80.1
74			0.148	1.12	75.1	1.04	-	6.67	-0.21	110.0	698.9	83.9	79.8
75			0.148	1.11	75.1	1.04	-	6.47	-0.19	109.7	695.0	83.9	80.2
76			0.147	1.13	75.1	1.03	-	6.26	-0.22	109.2	689.9	83.8	79.6
77			0.149	1.13	75.1	1.06	-	6.10	-0.16	108.5	680.4	83.7	80.0
78			0.148	1.13	75.1	1.07	-	5.91	-0.18	107.7	669.8	83.6	80.2
79			0.147	1.10	75.2	1.05	-	5.74	-0.17	106.7	657.0	83.4	80.0
80	569.532	0.143	0.148	1.13	75.2	1.06	101	5.62	-0.13	106.0	645.2	83.3	79.9
81			0.149	1.17	75.2	1.07	-	5.47	-0.15	105.2	634.9	83.3	79.9
82			0.148	1.11	75.2	1.06	-	5.34	-0.13	104.4	626.5	83.1	79.9
83			0.150	1.12	75.2	1.06	-	5.20	-0.14	104.0	617.7	83.1	80.0
84			0.150	1.10	75.3	1.06	-	5.08	-0.12	103.2	611.0	82.9	79.5
85			0.149	1.08	75.3	1.06	-	4.97	-0.11	102.3	601.9	82.9	79.3
86			0.149	0.89	75.2	1.07	-	4.88	-0.09	101.6	591.8	82.9	79.4
87			0.151	0.96	75.2	1.07	-	4.76	-0.12	101.0	582.3	82.8	79.3
88			0.150	0.96	75.2	1.07	-	4.66	-0.10	100.2	572.3	82.8	79.1
89			0.150	1.00	75.3	1.08	-	4.56	-0.10	99.4	560.9	82.6	78.9
90	570.970	0.144	0.150	0.96	75.3	1.06	100	4.49	-0.07	98.7	550.4	82.5	78.9
91			0.151	0.93	75.3	1.06	-	4.42	-0.08	98.1	542.8	82.3	78.7
92			0.152	1.09	75.3	1.06	-	4.34	-0.08	97.4	537.0	82.3	78.7
93			0.151	1.04	75.2	1.06	-	4.25	-0.09	97.2	532.4	82.2	78.4
94			0.151	1.06	75.2	1.06	-	4.17	-0.08	96.7	530.2	82.1	77.8
95			0.151	0.97	75.2	1.07	-	4.10	-0.07	96.5	528.0	82.2	77.9
96			0.151	0.99	75.2	1.07	-	4.02	-0.08	96.2	527.3	82.2	77.6
97			0.152	0.95	75.2	1.07	-	3.94	-0.07	95.8	522.0	82.4	77.5
98			0.151	0.96	75.2	1.08	-	3.90	-0.05	95.3	515.9	82.5	77.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.151	0.98	75.2	1.05	-	3.82	-0.07	94.8	511.3	82.4	77.5
100	572.414	0.144	0.151	1.03	75.3	1.05	100	3.76	-0.07	94.7	509.1	82.6	77.1
101			0.152	1.03	75.2	1.09	-	3.72	-0.04	94.2	503.9	82.6	76.8
102			0.151	1.00	75.3	1.09	-	3.64	-0.07	93.7	496.1	82.7	76.9
103			0.151	1.01	75.3	1.09	-	3.59	-0.06	93.1	488.2	82.7	76.6
104			0.153	1.00	75.3	1.08	-	3.57	-0.02	92.7	480.1	82.7	76.3
105			0.152	0.98	75.3	1.09	-	3.53	-0.04	92.7	474.5	82.6	77.2
106			0.152	0.98	75.3	1.09	-	3.48	-0.05	94.1	470.5	82.7	77.1
107			0.152	0.97	75.3	1.09	-	3.41	-0.07	94.3	465.3	82.7	77.0
108			0.152	0.99	75.4	1.11	-	3.37	-0.04	94.6	461.1	82.8	76.8
109			0.152	0.94	75.4	1.11	-	3.30	-0.07	94.7	456.1	82.8	76.7
110	573.877	0.146	0.152	0.94	75.4	1.10	101	3.26	-0.04	94.6	452.5	82.9	76.6
111			0.151	1.07	75.4	1.11	-	3.22	-0.03	94.5	449.1	82.9	76.7
112	574.178	0.151	0.151	0.98	75.4	1.11	104	3.21	-0.01	94.2	446.8	82.8	76.5
Avg/Tot	16.013	0.143	0.149	0.93	74.8	0.88	100			102.7	557.3	84.1	81.0

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	630.586		0.20	72.8	0.00		84.4	0.003	0.12	0.008	39.3	50.0
1			0.21	73.1	0.49	-	84.0	0.030	1.25	0.029	39.1	54.1
2			0.23	73.1	0.63	-	83.6	0.029	1.53	0.033	37.4	54.0
3			0.20	73.1	0.46	-	83.3	0.040	1.34	0.041	37.0	54.7
4			0.21	73.1	0.62	-	83.1	0.055	4.52	0.067	38.8	55.2
5			0.20	73.1	0.58	-	83.5	0.067	7.22	0.163	41.6	57.7
6			0.21	73.1	0.53	-	83.8	0.072	8.59	0.261	41.9	59.2
7			0.21	73.0	0.59	-	84.1	0.074	9.18	0.369	40.3	59.7
8			0.20	73.1	0.62	-	84.5	0.074	7.94	0.192	39.0	59.0
9			0.23	73.1	0.54	-	84.6	0.077	7.72	0.168	38.8	59.5
10	631.988	0.140	0.21	73.1	0.68	97	84.7	0.078	9.53	0.306	38.9	60.8
11			0.22	73.2	0.63	-	84.8	0.076	8.86	0.156	37.4	59.7
12			0.21	73.2	0.69	-	84.9	0.080	8.05	0.142	36.9	60.1
13			0.22	73.2	0.69	-	85.0	0.083	9.86	0.360	37.5	61.7
14			0.24	73.2	0.63	-	85.2	0.086	10.74	0.442	36.7	62.4
15			0.23	73.2	0.66	-	85.4	0.084	10.56	0.318	35.5	61.9
16			0.23	73.2	0.70	-	85.4	0.082	9.71	0.172	33.2	61.9
17			0.25	73.1	0.61	-	85.5	0.081	9.25	0.097	33.7	60.6
18			0.23	73.2	0.63	-	85.5	0.082	8.51	0.141	33.5	60.3
19			0.25	73.1	0.59	-	85.1	0.083	9.57	0.110	33.8	60.8
20	633.391	0.140	0.22	73.2	0.71	99	84.7	0.086	10.46	0.147	33.8	61.7
21			0.23	73.1	0.69	-	84.4	0.085	11.04	0.131	33.3	62.1
22			0.24	73.2	0.64	-	84.3	0.087	11.20	0.135	32.9	62.2
23			0.24	73.1	0.59	-	84.0	0.087	12.00	0.192	32.5	62.6
24			0.23	73.1	0.69	-	83.8	0.087	12.24	0.265	31.5	62.8
25			0.25	73.1	0.63	-	83.6	0.087	11.95	0.262	31.0	62.4
26			0.24	73.1	0.65	-	83.5	0.086	11.78	0.235	30.6	61.9
27			0.25	73.1	0.70	-	83.3	0.086	10.89	0.154	29.9	61.2
28			0.26	73.2	0.70	-	83.2	0.086	10.09	0.173	29.4	60.3
29			0.27	73.1	0.68	-	83.0	0.083	9.58	0.124	29.1	59.7
30	634.777	0.139	0.28	73.1	0.71	98	82.8	0.084	9.25	0.121	28.9	59.5
31			0.28	73.2	0.59	-	82.7	0.082	8.68	0.170	26.2	59.9
32			0.27	73.1	0.61	-	82.6	0.080	7.92	0.155	26.4	59.0
33			0.27	73.1	0.68	-	82.7	0.082	5.43	0.105	26.3	60.1
34			0.28	73.1	0.70	-	82.7	0.087	3.09	0.300	26.3	60.1
35			0.29	73.2	0.66	-	83.0	0.095	4.00	0.390	26.3	60.1
36			0.28	73.3	0.71	-	83.3	0.092	4.92	0.340	26.3	60.1
37			0.28	73.3	0.66	-	83.5	0.087	10.82	0.321	23.5	67.1
38			0.29	73.3	0.75	-	83.7	0.087	9.82	0.207	24.3	65.7

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.31	73.4	0.65	-	83.8	0.087	9.58	0.227	24.9	65.1
40	636.181	0.140	0.33	73.4	0.75	100	83.9	0.086	9.51	0.260	27.4	63.9
41			0.32	73.5	0.71	-	84.0	0.086	9.28	0.269	28.3	63.5
42			0.33	73.4	0.71	-	84.1	0.086	9.53	0.235	28.7	63.5
43			0.33	73.4	0.70	-	84.1	0.089	9.81	0.217	28.8	63.9
44			0.30	73.4	0.76	-	84.1	0.088	10.05	0.215	28.9	64.0
45			0.33	73.4	0.67	-	84.1	0.088	10.14	0.211	25.7	65.5
46			0.37	73.4	0.73	-	84.2	0.089	10.55	0.223	25.2	65.8
47			0.37	73.4	0.74	-	84.4	0.089	10.87	0.251	24.8	66.0
48			0.35	73.4	0.72	-	84.6	0.090	11.33	0.300	24.4	66.6
49			0.36	73.5	0.71	-	84.6	0.092	11.67	0.340	24.0	66.6
50	637.577	0.140	0.38	73.4	0.74	101	84.6	0.093	11.70	0.372	24.4	66.4
51			0.39	73.5	0.73	-	84.8	0.092	11.72	0.366	24.8	66.4
52			0.39	73.5	0.69	-	84.7	0.092	11.77	0.415	24.9	66.2
53			0.35	73.4	0.70	-	84.6	0.094	11.96	0.481	24.9	66.6
54			0.34	73.4	0.80	-	84.5	0.093	12.12	0.533	24.7	66.7
55			0.31	73.4	0.72	-	84.5	0.097	12.45	0.650	24.8	67.3
56			0.35	73.4	0.72	-	84.3	0.098	13.08	0.885	24.3	68.2
57			0.38	73.5	0.74	-	84.2	0.100	13.80	0.822	23.9	68.7
58			0.30	73.4	0.80	-	84.3	0.102	14.13	0.868	23.8	68.9
59			0.27	73.4	0.80	-	84.2	0.102	14.52	0.886	24.0	69.1
60	638.956	0.138	0.23	73.5	0.74	101	84.1	0.102	14.64	1.036	24.0	69.3
61			0.28	73.5	0.83	-	84.0	0.101	14.39	1.309	24.0	69.3
62			0.27	73.5	0.85	-	84.0	0.101	14.22	1.377	24.1	69.1
63			0.22	73.5	0.86	-	83.9	0.102	13.99	1.468	24.3	68.9
64			0.25	73.5	0.86	-	84.0	0.101	13.94	1.457	24.2	68.7
65			0.26	73.5	0.85	-	84.0	0.101	14.05	1.430	24.2	68.5
66			0.32	73.5	0.85	-	83.9	0.100	14.02	1.411	24.1	68.4
67			0.23	73.5	0.84	-	83.8	0.100	14.12	1.331	24.2	68.0
68			0.23	73.5	0.87	-	83.7	0.099	13.77	1.130	24.1	67.3
69			0.19	73.6	0.85	-	83.7	0.098	13.56	0.887	24.0	66.6
70	640.308	0.135	0.20	73.6	0.88	99	83.6	0.098	13.40	0.738	24.0	65.7
71			0.21	73.6	0.89	-	83.6	0.097	13.42	0.632	24.0	65.3
72			0.18	73.6	0.94	-	83.6	0.097	13.32	0.649	24.1	64.8
73			0.22	73.6	0.88	-	83.3	0.097	13.33	0.675	24.1	64.6
74			0.20	73.7	0.95	-	83.4	0.097	13.31	0.618	24.0	64.4
75			0.19	73.7	0.94	-	83.3	0.097	13.17	0.597	24.0	64.0
76			0.16	73.7	0.95	-	83.3	0.097	13.17	0.428	24.0	63.7
77			0.17	73.7	0.99	-	83.2	0.095	12.84	0.301	23.9	63.0

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.21	73.7	0.91	-	83.2	0.095	12.47	0.202	24.1	62.4
79			0.20	73.7	0.92	-	83.1	0.093	12.03	0.166	24.1	61.9
80	641.700	0.139	0.13	73.8	0.93	101	83.1	0.093	11.49	0.124	24.0	61.0
81			0.16	73.8	0.90	-	83.0	0.091	11.03	0.105	24.2	60.4
82			0.20	73.8	0.99	-	83.0	0.090	10.93	0.097	24.3	60.1
83			0.16	73.8	0.99	-	82.8	0.089	10.71	0.090	24.3	59.7
84			0.11	73.8	0.90	-	82.8	0.090	10.38	0.057	24.3	59.0
85			0.14	73.8	0.95	-	82.8	0.088	9.84	0.057	24.5	58.5
86			0.17	73.8	0.93	-	82.7	0.087	9.06	0.075	24.6	58.1
87			0.15	73.8	0.91	-	82.6	0.087	8.89	0.079	24.7	57.6
88			0.11	73.8	0.98	-	82.6	0.086	8.64	0.060	24.9	57.2
89			0.12	73.8	1.00	-	82.4	0.084	8.19	0.064	24.8	56.5
90	643.106	0.141	0.15	73.7	0.91	101	82.3	0.083	7.68	0.068	25.1	56.1
91			0.11	73.8	0.98	-	82.3	0.082	7.63	0.068	25.2	55.8
92			0.11	73.8	0.94	-	82.2	0.082	7.57	0.065	25.4	55.6
93			0.10	73.8	0.98	-	82.1	0.082	7.65	0.063	25.7	55.4
94			0.11	73.7	1.00	-	82.1	0.082	7.63	0.052	25.9	55.4
95			0.12	73.8	0.99	-	82.1	0.081	7.69	0.048	26.0	55.2
96			0.08	73.8	0.92	-	82.4	0.082	7.75	0.037	26.2	55.2
97			0.13	73.8	0.91	-	82.5	0.081	7.57	0.039	26.1	54.9
98			0.11	73.7	0.97	-	82.6	0.080	6.87	0.040	26.1	54.3
99			0.12	73.8	0.91	-	82.7	0.080	6.24	0.043	26.3	54.1
100	644.521	0.141	0.08	73.8	0.91	100	82.8	0.079	6.70	0.042	26.5	54.1
101			0.13	73.8	1.00	-	82.9	0.079	6.83	0.041	26.6	53.8
102			0.11	73.8	0.95	-	82.9	0.077	6.36	0.072	26.4	53.4
103			0.14	73.8	1.02	-	83.1	0.077	6.11	0.132	26.6	53.1
104			0.13	73.8	0.93	-	83.0	0.076	5.91	0.174	26.8	52.9
105			0.13	73.9	1.01	-	83.1	0.076	5.82	0.147	27.0	52.9
106			0.12	73.9	0.96	-	83.2	0.075	5.79	0.133	26.2	53.2
107			0.12	73.9	1.01	-	83.3	0.075	5.69	0.132	26.1	53.4
108			0.13	73.9	1.01	-	83.4	0.075	5.64	0.168	26.1	53.6
109			0.11	73.9	0.95	-	83.4	0.073	5.59	0.172	26.0	53.6
110	645.957	0.144	0.17	73.9	0.93	101	83.5	0.073	5.60	0.171	26.0	53.6
111			0.15	74.0	0.94	-	83.7	0.073	5.55	0.174	26.1	53.6
112	646.240	0.142	0.13	74.0	0.95	100	83.7	0.073	5.59	0.151	26.2	53.6
Avg/Tot	15.654	0.140	0.22	73.5	0.79	100	83.6	0.085	9.56	0.331	27.97	60.964

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 7

Technician: SJB

Date: 6/9/2023

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	235.033		0.40	73.3	1.00		85.2
1			0.40	73.4	1.00	-	85.1
2			0.40	73.4	1.00	-	84.9
3			0.40	73.4	1.00	-	84.7
4			0.40	73.4	1.00	-	84.5
5			0.40	73.4	1.00	-	84.5
6			0.40	73.4	1.00	-	84.5
7			0.40	73.5	1.00	-	84.5
8			0.40	73.5	1.00	-	84.4
9			0.40	73.5	1.00	-	84.4
10	236.323	0.129	0.40	73.5	1.00	97	84.4
11			0.40	73.5	1.00	-	84.2
12			0.40	73.5	1.00	-	84.1
13			0.40	73.5	1.00	-	83.9
14			0.40	73.5	1.00	-	83.8
15			0.40	73.5	1.00	-	83.7
16			0.40	73.5	1.00	-	83.6
17			0.40	73.6	1.00	-	83.6
18			0.40	73.6	1.00	-	83.4
19			0.40	73.6	1.00	-	83.3
20	237.620	0.130	0.40	73.6	1.00	99	83.2
21			0.40	73.6	1.00	-	83.1
22			0.40	73.6	1.00	-	83.1
23			0.40	73.6	1.00	-	82.9
24			0.40	73.6	1.00	-	82.8
25			0.40	73.6	1.00	-	82.8
26			0.40	73.6	1.00	-	82.7
27			0.40	73.6	1.00	-	82.6
28			0.40	73.7	1.00	-	82.7
29			0.40	73.7	1.00	-	82.6
30	238.922	0.130	0.40	73.7	1.00	100	82.6
31			0.40	73.7	1.00	-	82.6

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 7

Technician: SJB

Date: 6/9/2023

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.40	73.7	1.00	-	82.5
33			0.40	73.7	1.00	-	82.6
34			0.40	73.7	1.00	-	82.7
35			0.40	73.7	1.00	-	83.1
36			0.40	73.8	1.00	-	83.5
37			0.40	73.8	1.00	-	83.9
38			0.40	73.8	1.00	-	84.1
39			0.40	73.8	1.00	-	84.5
40	240.210	0.129	0.40	73.8	1.00	100	84.7
41			0.40	73.9	1.00	-	85.0
42			0.40	73.9	1.00	-	85.2
43			0.40	73.8	1.00	-	85.5
44			0.40	73.9	1.00	-	85.6
45			0.40	73.9	1.00	-	85.8
46			0.40	73.9	1.00	-	86.0
47			0.40	73.9	1.00	-	86.1
48			0.40	73.9	1.00	-	86.4
49			0.40	73.9	1.00	-	86.5
50	241.518	0.131	0.40	73.9	1.00	102	86.7
51			0.40	74.0	1.00	-	86.9
52			0.40	74.0	1.00	-	86.9
53			0.40	74.0	1.00	-	86.8
54			0.40	74.0	1.00	-	86.7
55			0.40	74.0	1.00	-	86.5
56			0.40	74.0	1.00	-	86.3
57			0.40	74.0	1.00	-	86.2
58			0.40	74.0	1.00	-	86.1
59			0.40	74.0	1.00	-	86.0
60	242.766	0.125	0.40	74.0	1.00	99	85.9
Avg/Tot	7.733	0.129	0.40	73.7	1.00	100	84.5

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
0	80.4	79.4	80.0	81.7	79.2	80.1	N/A	
1	90.3	79.4	80.1	81.7	79.2	82.1	N/A	
2	103.8	79.4	80.6	81.7	79.3	85.0	N/A	
3	118.6	79.5	81.9	81.9	79.6	88.3	N/A	
4	144.8	79.4	83.8	82.2	80.3	94.1	N/A	
5	197.8	79.4	86.4	82.8	81.6	105.6	N/A	
6	267.1	79.4	90.0	83.7	83.9	120.8	N/A	
7	333.8	79.5	94.7	84.8	87.6	136.1	N/A	
8	385.9	79.7	100.3	86.4	91.5	148.8	N/A	
9	427.0	80.0	106.3	88.3	95.5	159.4	N/A	
10	469.6	80.5	112.7	90.8	100.3	170.8	N/A	
11	503.9	81.1	119.9	93.7	105.6	180.8	N/A	
12	525.8	81.9	127.3	97.2	111.0	188.6	N/A	
13	552.8	82.9	134.8	101.3	116.2	197.6	N/A	
14	583.5	84.2	142.2	106.0	120.6	207.3	N/A	
15	610.5	85.8	149.5	111.2	124.1	216.2	N/A	
16	628.6	87.7	156.4	116.6	127.2	223.3	N/A	
17	638.0	90.0	163.2	122.6	130.6	228.9	N/A	
18	637.4	92.8	169.8	128.9	134.9	232.8	N/A	
19	636.4	96.0	176.2	135.5	140.4	236.9	N/A	
20	641.6	99.6	182.5	142.3	146.2	242.5	N/A	
21	655.3	103.3	189.4	149.2	151.9	249.8	N/A	
22	670.5	107.4	196.8	156.1	158.6	257.9	N/A	
23	684.5	111.7	205.0	162.9	165.5	265.9	N/A	
24	698.8	116.1	214.1	170.2	172.6	274.4	N/A	
25	712.2	120.8	224.0	178.0	180.0	283.0	N/A	
26	722.6	125.5	234.5	186.1	187.4	291.2	N/A	
27	729.0	130.4	245.5	194.4	195.1	298.9	N/A	
28	732.7	135.2	256.5	202.9	202.8	306.0	N/A	
29	732.8	140.2	267.2	211.8	210.5	312.5	N/A	
30	730.0	145.2	277.7	221.0	218.2	318.4	N/A	
31	721.1	150.1	287.8	229.5	225.6	322.8	N/A	
32	708.1	154.9	297.6	238.4	232.9	326.4	N/A	
33	693.7	160.0	308.8	248.9	240.7	330.4	N/A	
34	667.1	165.2	320.0	258.5	248.5	331.9	N/A	
35	648.8	170.8	326.9	267.3	255.5	333.8	N/A	
36	658.8	175.9	329.4	275.3	262.3	340.3	N/A	
37	674.0	180.8	328.9	282.3	268.4	346.9	N/A	
38	682.1	185.4	327.1	288.6	273.9	351.4	N/A	
39	687.9	189.8	325.0	294.4	278.9	355.2	N/A	
40	694.2	194.0	323.0	300.0	283.6	359.0	N/A	
41	697.4	198.4	321.3	305.1	287.9	362.0	N/A	
42	701.0	202.5	319.8	309.9	291.4	364.9	N/A	
43	703.6	206.6	318.5	314.2	294.5	367.5	N/A	
44	707.2	210.5	317.6	318.2	296.9	370.1	N/A	
45	710.7	214.2	317.2	321.2	298.0	372.3	N/A	
46	717.0	217.5	316.9	324.1	299.1	374.9	N/A	
47	725.0	220.6	316.8	326.6	300.1	377.8	N/A	



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
48	736.3	223.9	317.2	329.0	300.9	381.5	N/A	
49	748.0	227.0	317.9	330.9	301.4	385.1	N/A	
50	759.0	229.8	318.9	332.3	302.2	388.5	N/A	
51	768.3	233.1	320.2	334.1	303.2	391.8	N/A	
52	776.4	235.7	321.7	335.7	304.0	394.7	N/A	
53	783.4	238.4	323.4	337.5	304.9	397.5	N/A	
54	790.1	241.1	325.3	339.4	306.0	400.4	N/A	
55	797.1	243.3	327.4	340.4	306.8	403.0	N/A	
56	807.7	244.7	329.7	341.1	307.3	406.1	N/A	
57	821.4	246.2	332.0	342.7	306.8	409.8	N/A	
58	836.6	248.5	334.6	344.3	307.9	414.4	N/A	
59	853.7	251.0	337.2	346.4	309.1	419.5	N/A	
60	867.9	253.6	340.0	348.8	310.9	424.2	N/A	
61	882.7	256.5	343.0	350.9	313.2	429.3	N/A	
62	895.7	259.2	346.3	353.3	315.2	434.0	N/A	
63	907.3	262.5	349.9	355.7	317.4	438.6	N/A	
64	916.7	265.0	353.8	358.6	320.0	442.8	N/A	
65	921.8	267.9	358.0	361.3	322.1	446.2	N/A	
66	929.5	270.8	362.3	365.0	324.3	450.4	N/A	
67	931.6	274.3	367.0	368.0	327.1	453.6	N/A	
68	935.0	277.3	371.9	371.3	329.8	457.0	N/A	
69	934.3	280.6	376.8	375.0	332.8	459.9	N/A	
70	933.4	284.2	381.8	378.7	335.4	462.7	N/A	
71	932.0	287.8	386.7	382.7	338.4	465.5	N/A	
72	928.6	290.7	391.7	385.7	341.3	467.6	N/A	
73	924.7	294.3	396.6	389.0	344.1	469.7	N/A	
74	922.4	298.1	401.3	392.0	347.3	472.2	N/A	
75	917.9	301.4	406.1	395.0	350.2	474.1	N/A	
76	914.1	305.0	411.0	397.6	353.6	476.2	N/A	
77	909.0	308.8	415.6	400.1	356.8	478.1	N/A	
78	901.9	312.7	420.1	402.8	360.1	479.5	N/A	
79	892.8	316.0	424.2	405.1	363.4	480.3	N/A	
80	881.8	320.0	428.2	407.5	366.9	480.9	N/A	
81	869.6	323.0	432.0	409.8	370.4	481.0	N/A	
82	856.6	326.3	435.6	411.8	373.7	480.8	N/A	
83	845.7	329.7	439.1	413.9	377.2	481.1	N/A	
84	835.8	332.8	442.4	416.0	380.5	481.5	N/A	
85	828.5	335.9	445.5	418.3	383.5	482.3	N/A	
86	818.8	338.6	448.6	420.1	386.4	482.5	N/A	
87	807.4	341.3	451.5	422.2	389.3	482.4	N/A	
88	795.2	343.4	454.2	423.5	391.9	481.6	N/A	
89	779.3	346.5	456.8	424.5	394.5	480.3	N/A	
90	766.0	348.3	458.8	425.6	396.5	479.1	N/A	
91	751.6	351.1	460.2	426.1	398.8	477.6	N/A	
92	738.2	352.6	461.4	425.7	400.7	475.7	N/A	
93	727.3	354.4	462.5	425.5	402.3	474.4	N/A	
94	718.5	355.8	463.3	425.1	403.6	473.2	N/A	
95	710.6	357.1	463.9	424.5	404.8	472.2	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
96	704.4	358.7	464.4	423.7	405.8	471.4	N/A
97	698.2	359.6	464.6	422.7	406.6	470.3	N/A
98	691.3	361.1	464.8	421.7	407.2	469.2	N/A
99	686.2	362.0	464.9	420.7	407.7	468.3	N/A
100	680.9	363.1	464.9	419.3	408.0	467.2	N/A
101	677.3	364.0	464.5	417.9	407.9	466.3	N/A
102	669.2	364.7	464.1	416.4	408.1	464.5	N/A
103	660.9	366.1	463.3	415.1	408.0	462.7	N/A
104	650.9	366.5	462.4	413.6	407.7	460.2	N/A
105	641.9	367.9	461.1	412.5	407.0	458.1	N/A
106	632.2	367.9	459.9	410.6	405.2	455.2	N/A
107	624.4	367.7	458.7	409.4	403.6	452.7	N/A
108	616.3	367.8	457.6	407.5	402.0	450.3	N/A
109	608.3	368.1	456.6	406.0	400.7	447.9	N/A
110	600.6	368.0	455.4	404.2	399.5	445.5	N/A
111	594.6	368.0	454.1	402.4	398.3	443.5	N/A
112	588.2	367.8	453.1	400.7	397.4	441.4	N/A
Average	698.9	233.5	325.5	302.2	284.4	369	N/A

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 7

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0174	183.8	186.2	2.4
	<b>B</b>	H0175	178.7	181.1	2.4
	<b>C - 1st Hour</b>	H0176	181.2	182.9	1.7
	<b>Amb</b>	H0158	94.6	94.6	0.0
<b>Probes</b>	<b>A</b>	10A	116645.5	116645.5	0.0
	<b>B</b>	10B	117753.6	117753.9	0.3
	<b>C - 1st Hour</b>	10C	116727.8	116727.9	0.1
<b>O-rings</b>	<b>A</b>	10A	3360.7	3361.1	0.4
	<b>B</b>	10B	3570.6	3571.0	0.4
	<b>C - 1st Hour</b>	10C	3366.0	3366.2	0.2

**Placed in Dessicator on:** 6/12 - 10:30

**Balance Audit (mg):** 100.0 100.0 100.0

*Undessicated      Dessicated      Dessicated      Desiccated*

		Undessicated	Dessicated	Dessicated	Desiccated
<b>Filters</b>	<b>A</b>	186.5    6/9 11:44	186.2    6/14 10:49	186.2    6/15 12:37	
	<b>B</b>	181.0    6/9 11:44	181.2    6/14 10:49	181.1    6/15 12:37	
	<b>C - 1st Hour</b>	183.0    6/9 10:52	183.0    6/14 10:49	182.9    6/15 12:37	
	<b>Amb</b>	94.7    6/9 11:44	94.6    6/14 10:50	94.6    6/15 12:38	
<b>Probes</b>	<b>A</b>		116645.5    6/14 10:59	116645.5    6/15 12:48	
	<b>B</b>		117753.8    6/14 10:59	117753.9    6/15 12:48	
	<b>C - 1st Hour</b>		116727.8    6/14 10:59	116727.9    6/15 12:49	
<b>O-Rings</b>	<b>A</b>		3361.0    6/14 10:38	3361.1    6/15 12:26	
	<b>B</b>		3570.9    6/14 10:39	3571.0    6/15 12:26	
	<b>C - 1st Hour</b>		3366.1    6/14 10:39	3366.2    6/15 12:27	

<b>Train A Aggregate, mg:</b>	<b>2.8</b>
<b>Train B Aggregate, mg:</b>	<b>3.1</b>
<b>Train C Aggregate, mg:</b>	<b>2.0</b>
<b>Ambient Aggregate, mg:</b>	<b>0.0</b>

## ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
 Model: 1.7R Run Number: 8 Test Date: 6/9/2023

### Wood Heater Run Notes

**High Fire Test Notes**

Test Burn Start Time: 13:45  
 Air Control Setting: Fully Open

Time	Notes
13:45	Light newspaper on top of kindling with torch (10 seconds) left door open Door closed, fan off, air set to high (fully open) @ 1.70 lbs, leveled coal bed and loaded high fire test load, door left open Closed door, fan turned on to max speed Ended test at 3.10 lbs (1.70 lbs coal bed + 1.40 lbs of high fire load) remaining
13:48	
14:21	
14:25	
15:31	

Test Burn End Time: 15:31

**Low/Medium Fire Test Notes**

Test Burn Start Time: N/A  
 Air Control Setting: N/A

Time	Notes

Test Burn End Time: N/A

### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 18.00 CO (%): 4.35  
 Mid Gas CO<sub>2</sub> (%): 10.10 CO (%): 1.98

**Calibration Results:**

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:31	8:50	8:36	15:55	15:50	16:00
CO <sub>2</sub>	0.00	10.28	18.01	0.008	9.99	17.95
CO	0.000	2.041	4.352	-0.009	1.948	4.316

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

Technician Signature: 

Date: 6/13/2023

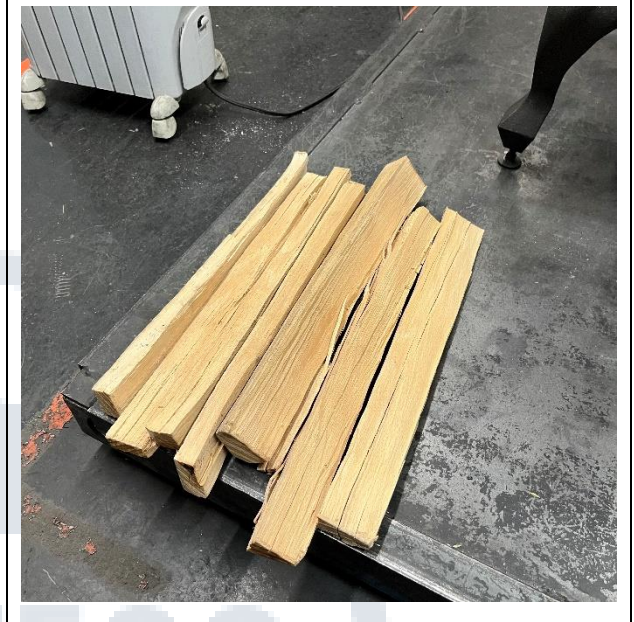
# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 8 Test Date: 6/9/2023

## Test Photos



**Kindling Fuel Load**



**Start-up Fuel Load**



**Kindling & Start-up Loaded in Stove**



**High Fire Fuel Load**

Technician Signature: *Sebastian Burton*

Date: 6/13/2023

# ASTM E3053 Wood Heater Run Sheets

Client: SBI Job Number: 23-161 Tracking #: 135  
Model: 1.7R Run Number: 8 Test Date: 6/9/2023



Residual Start-up Fuel Coal Bed – Pre Rake



Residual Start-up Fuel Coal Bed – Post Rake



High Fire Fuel Loaded



Air Setting – High Fire

Technician Signature: *Sebastian E. Collins*

Date: 6/13/2023

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 8 Data Summary**

Client: SBI  
Model: 1.7R  
Job #: 23-161  
Tracking #: 135  
Test Date: 6/9/2023

A handwritten signature in black ink, appearing to read "Sebastian Eustace", is written over a horizontal line.

Techician Signature

7/3/2023

Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI

Model: 1.7R

Run #: 8

Job #: 23-161

Tracking #: 135

Technician: SJB

Date: 6/9/2023

<b>Burn Rate (kg/hr):</b>	<b>4.40</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	18.621	15.144	14.806	7.752
Average Gas Velocity in Dilution Tunnel (ft/sec)	25.14			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	28609.9			
Average Gas Meter Temperature (°F)	80.8	75.9	74.5	85.1
Total Sample Volume (dscf)	18.103	15.081	14.704	7.403
Average Tunnel Temperature (°F)	103.0			
Total Time of Test (min)	106			
Total Particulate Catch (mg)	0.1	3.6	3.4	2.3
Particulate Concentration, dry-standard (g/dscf)	0.0000055	0.0002387	0.0002312	0.0003107
Total PM Emissions (g)	0.28	11.79	11.41	8.73
Particulate Emission Rate (g/hr)	0.16	6.67	6.46	8.73
Emissions Factor (g/kg)	-	1.70	1.65	-
Difference from Average Total Particulate Emissions (g)	-	0.19	0.19	-
Difference from Average Total Particulate Emissions (%)	-	1.6%	1.6%	-
Difference from Average Emissions Factor (g/kg)	-	0.03	0.03	-

Final Average Results	
Total Particulate Emissions (g)	11.60
Particulate Emission Rate (g/hr)	6.56
Emissions Factor (g/kg)	1.68
HHV Efficiency (%)	65.0%
LHV Efficiency (%)	69.6%
CO Emissions (g/min)	5.81

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: 88.6	OK
Face Velocity	< 30 ft/min	8.0	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min:76.1/Max:87.7	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK



## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 06/09/23  
**Run:** 8  
**Control #:** 23-161  
**Test Duration:** 69  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	65.0%	69.6%
<b>Combustion Efficiency</b>	94.3%	94.3%
<b>Heat Transfer Efficiency</b>	68.9%	73.8%

<b>Output Rate (kJ/h)</b>	55,033	52,205	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	4.50	9.93	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	84,666	80,315	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	5.18	11.41	<b>dry lb</b>
<b>MC wet (%)</b>	16.66		
<b>MC dry (%)</b>	19.99		
<b>Particulate (g )</b>	11.60		
<b>CO (g)</b>	401		
<b>Test Duration (h)</b>	1.15		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.18	6.33
<b>g/kg Dry Fuel</b>	2.24	77.34
<b>g/h</b>	10.08	348.32
<b>g/min</b>	0.17	5.81
<b>lb/MM Btu Output</b>	0.43	14.71

<b>Air/Fuel Ratio (A/F)</b>	9.94
-----------------------------	------

VERSION:

2.4

4/15/2010

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking # 135  
 Technician: SJB  
 Date: 6/9/2023

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 3.01  
 Max Allowable Start-up Fuel Weight (lbs): 4.52

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	3.14	In Range	18.7	23.1	18.4	20.1	In Range	2.61	1.18
2	16.00	3.08	In Range	17.7	26.0	21.7	21.8	In Range	2.53	1.15
3	16.25	2.59	In Range	23.1	15.8	17.8	18.9	In Range	2.17	0.99
Core Load Wt. (lbs)		8.80	In Range							

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	3.92	In Range	18.9	22.6	17.3	19.6	In Range	3.28	1.49
2	15.75	2.33	In Range	23.1	17.1	18.1	19.4	In Range	1.95	0.89
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.26	In Range							

Total Load Weight (lbs): 15.06 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: 105% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.5  
 Total Load Average Moisture Content (%DB): 20.0 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.7  
 Total Test Load Weight (dry basis): 12.55 lbs 5.69 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.85	In Range	10	10	10	10.0	In Range	2.59	1.17

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
3.98	In Range	18.1	28.5	24.1	23.6	In Range	3.22	1.46

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 3.0  
 Actual Residual Start-up Fuel Weight (lb): 1.70 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.4 to 1.7 lb  
 Actual Fuel Load Ending Weight (lb): 1.40 In Range

Total Weight All Fuel Added: 21.89 lbs, wet basis  
 18.36 lbs, dry basis  
 8.33 kg, dry basis

Total Weight All Fuel Burned (dry basis): 15.26 lbs  
 6.92 kg

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 8  
 Test Start Time: 13:45  
 Test Type: High Fire

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Recording Interval (min): 1  
 Total Sampling Time (min): 106  
 High Fire Test Load Time (min): 37

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 6/5/2023  
 Test Fuel Scale Audit (kg): 5.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.52	29.50	29.51
Relative Humidity (%)	39.4	38.9	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Platform Scale Audit (kg)	5.0	5.0	
Ambient Sample Volume:	18.621 ft <sup>3</sup>		

### Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.000	0.000	cfm @	-5 in. Hg
(B)	0.001	0.002	cfm @	-5 in. Hg
(C)	0.000	0.000	cfm @	-5 in. Hg
(Ambient)	0.000	0.000	cfm @	-5 in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.121	80
2	0.145	80
3	0.148	79
4	0.136	79
5	0.107	77
6	0.142	77
7	0.148	77
8	0.132	77
Center	0.151	80

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

$V_{strav}$ : 24.72 ft/sec  
 $V_{scent}$ : 26.23 ft/sec  
 $F_p$ : 0.942 [ratio]  
 Initial Tunnel Flow: 490.5 scf/min

Static Pressure: -0.319 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI \_\_\_\_\_  
Model: 1.7R \_\_\_\_\_  
Run #: 8 \_\_\_\_\_

Job #: 23-161 \_\_\_\_\_  
Tracking #: 135 \_\_\_\_\_  
Technician: SJB \_\_\_\_\_  
Date: 6/9/2023 \_\_\_\_\_

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

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	574.420		0.157	0.98	75.3	0.00		6.97		76.3	79.6	88.2	78.9
1			0.157	1.00	75.9	0.57	-	6.89	-0.08	79.2	112.6	87.6	80.1
2			0.156	1.04	75.9	0.56	-	6.83	-0.06	81.5	141.6	86.8	81.5
3			0.156	1.01	76.0	0.59	-	6.71	-0.11	85.1	175.6	86.2	81.7
4			0.157	1.00	76.0	0.58	-	6.59	-0.13	81.3	212.3	85.5	82.3
5			0.157	1.01	76.1	0.60	-	6.49	-0.10	80.9	247.0	85.1	82.5
6			0.154	1.05	76.1	0.59	-	6.30	-0.19	83.4	320.4	84.9	81.9
7			0.154	1.04	76.1	0.61	-	6.16	-0.14	84.8	366.0	84.7	81.3
8			0.155	1.03	76.1	0.63	-	5.99	-0.17	86.0	396.8	84.5	81.4
9			0.154	1.04	76.1	0.61	-	5.80	-0.18	87.7	433.2	84.4	82.3
10	575.848	0.143	0.153	1.04	76.1	0.64	96	5.64	-0.16	88.3	442.4	84.2	83.7
11			0.153	1.08	76.1	0.63	-	5.49	-0.15	88.3	441.8	84.1	84.2
12			0.153	1.01	76.0	0.62	-	5.31	-0.19	89.6	460.9	84.0	84.2
13			0.152	1.04	75.9	0.64	-	5.07	-0.24	92.2	508.4	84.1	83.3
14			0.153	1.07	76.0	0.65	-	4.86	-0.21	93.7	538.9	83.9	83.6
15			0.151	1.08	75.9	0.65	-	4.64	-0.22	96.3	551.9	83.8	83.0
16			0.152	1.05	76.0	0.66	-	4.39	-0.25	102.2	579.4	83.8	82.5
17			0.152	1.08	76.0	0.66	-	4.19	-0.21	98.9	572.0	83.6	81.0
18			0.151	1.07	76.0	0.68	-	3.99	-0.20	98.9	575.0	83.2	80.4
19			0.150	1.10	76.0	0.65	-	3.79	-0.20	98.8	572.2	82.9	79.8
20	577.281	0.143	0.151	1.06	76.0	0.65	99	3.61	-0.18	98.8	567.3	82.7	78.8
21			0.150	1.08	76.0	0.66	-	3.44	-0.18	99.0	569.6	82.8	79.0
22			0.150	1.12	75.9	0.67	-	3.26	-0.17	99.3	567.5	83.3	79.4
23			0.150	1.12	75.9	0.68	-	3.12	-0.14	99.2	561.9	83.7	79.4
24			0.151	1.09	75.9	0.69	-	2.96	-0.16	99.5	553.4	84.2	81.4
25			0.151	1.12	75.9	0.69	-	2.84	-0.13	99.5	545.7	84.7	82.3
26			0.151	1.12	75.9	0.68	-	2.70	-0.14	99.4	539.5	85.2	81.7
27			0.151	1.13	75.8	0.68	-	2.58	-0.12	99.1	531.2	85.6	82.0
28			0.151	1.12	75.9	0.68	-	2.47	-0.11	99.0	525.3	86.0	82.3
29			0.152	1.13	75.9	0.69	-	2.34	-0.14	99.3	519.8	86.3	81.7
30	578.717	0.144	0.152	1.13	75.9	0.69	100	2.25	-0.09	99.9	512.7	86.8	83.5
31			0.152	1.15	75.8	0.68	-	2.13	-0.12	99.8	505.2	87.1	84.5
32			0.151	1.07	75.8	0.70	-	2.07	-0.06	99.6	497.2	87.3	84.0

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.152	1.09	75.7	0.70	-	1.96	-0.11	99.0	490.0	87.0	85.0
34			0.152	1.02	75.7	0.68	-	1.87	-0.09	99.1	484.4	86.6	85.4
35			0.151	1.14	75.7	0.69	-	1.79	-0.08	99.1	477.2	86.3	85.1
36			0.153	1.04	75.7	0.69	-	1.71	-0.07	97.3	469.4	85.9	84.8
37			0.146	0.93	75.7	0.71	-	16.76	15.05	122.4	478.1	86.5	85.4
38			0.145	1.00	75.7	0.68	-	16.39	-0.37	129.8	468.0	86.8	86.0
39			0.142	0.98	75.7	0.76	-	16.04	-0.35	137.5	504.4	87.3	85.9
40	580.146	0.143	0.140	0.96	75.8	0.79	103	15.65	-0.39	144.6	615.2	87.2	86.7
41			0.149	0.97	75.8	0.80	-	15.43	-0.22	114.1	581.7	85.8	86.6
42			0.149	0.95	75.8	0.86	-	15.18	-0.25	108.1	583.1	85.2	87.7
43			0.148	0.90	75.7	0.87	-	14.89	-0.29	111.1	596.8	85.1	86.0
44			0.149	0.87	75.8	0.89	-	14.67	-0.22	110.7	610.8	85.1	83.9
45			0.148	0.88	75.8	0.89	-	14.43	-0.24	110.4	622.9	84.8	83.7
46			0.148	0.82	75.7	0.89	-	14.17	-0.26	110.5	637.1	84.6	81.9
47			0.148	0.83	75.7	0.90	-	13.90	-0.27	110.5	647.7	84.5	80.9
48			0.148	0.84	75.8	0.91	-	13.63	-0.27	109.7	645.5	84.3	81.4
49			0.148	0.84	75.8	0.91	-	13.39	-0.24	108.4	638.5	84.2	81.7
50	581.565	0.142	0.148	0.87	75.8	0.89	103	13.16	-0.24	107.6	636.4	84.0	81.9
51			0.148	0.76	75.8	0.90	-	12.92	-0.24	107.3	640.1	83.9	81.2
52			0.149	0.74	75.8	0.90	-	12.66	-0.26	107.3	647.3	83.7	80.3
53			0.148	0.75	75.8	0.89	-	12.44	-0.23	107.4	656.0	83.5	79.6
54			0.148	0.79	75.9	0.90	-	12.15	-0.28	107.4	665.9	83.3	79.4
55			0.148	0.78	75.9	0.89	-	11.92	-0.23	108.0	677.5	83.3	79.2
56			0.147	0.78	75.9	0.91	-	11.65	-0.28	108.3	694.4	83.3	78.6
57			0.148	0.66	75.8	0.89	-	11.39	-0.26	109.2	708.3	83.2	78.9
58			0.148	0.75	75.8	0.90	-	11.11	-0.28	110.2	728.8	83.1	78.3
59			0.147	0.80	75.9	0.91	-	10.81	-0.30	111.2	743.6	83.1	78.4
60	582.999	0.143	0.148	0.72	75.9	0.92	102	10.52	-0.29	111.9	754.2	83.1	78.2
61			0.147	0.78	75.9	0.92	-	10.20	-0.32	112.2	752.1	83.1	78.0
62			0.147	0.79	75.9	0.92	-	9.91	-0.29	112.3	746.0	83.0	78.3
63			0.147	0.78	75.9	0.91	-	9.63	-0.28	112.4	743.7	82.9	78.8
64			0.147	0.76	75.9	0.92	-	9.32	-0.30	112.3	740.9	82.9	78.9
65			0.147	0.80	75.9	0.91	-	9.03	-0.30	112.2	739.6	82.8	79.1

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.148	0.70	75.9	0.93	-	8.75	-0.28	112.3	737.5	82.7	78.8
67			0.146	0.68	76.0	0.94	-	8.46	-0.29	112.1	731.1	82.7	79.2
68			0.147	0.67	76.0	0.96	-	8.17	-0.29	112.0	723.4	82.8	78.6
69			0.145	0.71	76.1	0.95	-	7.91	-0.27	111.8	720.4	82.7	78.8
70	584.400	0.140	0.147	0.66	76.1	0.98	100	7.63	-0.27	111.7	721.9	82.6	79.1
71			0.146	0.67	76.1	1.00	-	7.38	-0.25	111.6	721.9	82.8	79.2
72			0.147	0.66	76.1	1.00	-	7.12	-0.26	111.6	723.7	82.6	79.4
73			0.147	0.68	76.1	1.01	-	6.85	-0.27	111.6	722.9	82.7	79.7
74			0.146	0.68	76.2	0.99	-	6.59	-0.26	111.6	724.7	82.6	80.0
75			0.147	0.68	76.1	1.01	-	6.34	-0.25	111.7	726.0	82.6	80.0
76			0.147	0.67	76.1	1.01	-	6.11	-0.23	111.6	726.9	82.6	80.0
77			0.146	0.71	76.1	1.02	-	5.88	-0.23	111.6	727.9	82.4	80.0
78			0.147	0.69	76.1	1.02	-	5.66	-0.23	111.5	727.4	82.5	80.1
79			0.147	0.68	76.1	1.03	-	5.45	-0.21	110.8	717.6	82.3	80.3
80	585.786	0.139	0.148	0.72	76.1	1.03	98	5.26	-0.19	110.1	703.7	82.3	80.8
81			0.148	0.68	76.1	1.04	-	5.11	-0.16	109.3	689.4	82.2	80.6
82			0.147	0.73	76.1	1.07	-	4.92	-0.19	108.2	676.8	82.2	80.4
83			0.148	0.71	76.0	1.06	-	4.76	-0.16	107.7	666.6	82.0	79.9
84			0.148	0.73	76.0	1.06	-	4.60	-0.16	107.2	655.0	82.2	80.0
85			0.149	0.74	76.0	1.06	-	4.47	-0.13	106.4	643.3	82.3	79.8
86			0.148	0.75	76.0	1.07	-	4.34	-0.13	105.3	629.0	82.6	80.3
87			0.149	0.75	76.0	1.05	-	4.23	-0.11	104.3	616.6	82.6	80.0
88			0.148	0.76	76.0	1.06	-	4.10	-0.13	103.5	606.4	83.0	79.9
89			0.150	0.76	76.0	1.06	-	4.00	-0.10	103.0	597.2	83.1	79.7
90	587.207	0.142	0.149	0.78	76.1	1.12	100	3.89	-0.11	102.0	587.1	83.2	79.6
91			0.150	0.76	76.1	1.10	-	3.81	-0.09	101.3	577.5	83.3	79.5
92			0.150	0.77	76.0	1.11	-	3.71	-0.09	100.7	568.6	83.3	79.4
93			0.151	0.77	76.0	1.10	-	3.65	-0.06	100.0	559.0	83.6	79.3
94			0.150	0.78	76.0	1.11	-	3.59	-0.06	99.0	549.2	83.7	78.8
95			0.150	0.79	76.0	1.10	-	3.52	-0.07	98.3	540.5	83.7	78.7
96			0.153	0.79	76.0	1.12	-	3.46	-0.06	97.9	534.6	83.9	78.9
97			0.152	0.77	76.0	1.12	-	3.40	-0.05	97.6	529.1	83.8	78.3
98			0.151	0.76	76.0	1.12	-	3.37	-0.04	97.0	520.8	83.9	78.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.151	0.79	76.0	1.09	-	3.32	-0.04	96.4	512.1	83.9	77.9
100	588.671	0.146	0.153	0.79	76.0	1.10	102	3.28	-0.04	95.7	504.6	84.0	78.0
101			0.152	0.80	76.1	1.10	-	3.24	-0.05	95.2	498.2	84.0	77.3
102			0.152	0.79	76.1	1.11	-	3.21	-0.02	94.7	491.9	84.0	77.5
103			0.152	0.76	76.0	1.10	-	3.16	-0.06	94.3	485.8	84.2	77.1
104			0.152	0.81	76.0	1.11	-	3.12	-0.03	93.8	479.1	84.2	76.8
105			0.153	0.82	76.0	1.12	-	3.10	-0.03	93.5	473.2	84.2	77.1
106	589.564	0.149	0.152	0.79	76.0	1.12	103	3.06	-0.03	92.9	465.7	84.1	76.1
Avg/Tot	15.144	0.143	0.150	0.88	75.9	0.86	101			103.0	570.7	84.1	80.8



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	646.471		0.20	74.6	0.00		82.9	0.002	0.11	0.000	39.7	49.5
1			0.12	74.8	0.49	-	83.6	0.030	1.10	0.018	40.4	52.3
2			0.18	74.8	0.63	-	84.2	0.030	1.70	0.032	39.1	53.4
3			0.21	74.9	0.62	-	85.0	0.045	1.64	0.047	37.9	55.4
4			0.16	74.9	0.64	-	85.5	0.047	4.88	0.107	40.3	53.8
5			0.21	74.9	0.58	-	85.6	0.055	5.56	0.104	42.1	55.0
6			0.13	74.9	0.64	-	85.6	0.069	7.19	0.163	43.4	57.7
7			0.19	74.9	0.55	-	85.4	0.070	8.17	0.143	42.2	58.3
8			0.14	74.8	0.61	-	85.4	0.074	7.93	0.094	41.6	59.0
9			0.12	74.8	0.57	-	85.5	0.077	9.23	0.096	41.1	60.3
10	647.874	0.140	0.13	74.8	0.54	97	85.3	0.075	8.67	0.133	39.3	59.4
11			0.14	74.8	0.54	-	85.4	0.074	8.09	0.138	38.3	58.8
12			0.10	74.7	0.67	-	85.4	0.082	7.94	0.136	38.1	59.5
13			0.12	74.7	0.69	-	85.4	0.085	11.89	0.282	38.6	62.2
14			0.12	74.6	0.56	-	85.2	0.086	12.23	0.307	36.8	62.2
15			0.13	74.6	0.61	-	85.0	0.086	11.75	0.196	35.0	62.6
16			0.14	74.6	0.68	-	84.9	0.088	9.90	0.209	29.8	65.5
17			0.14	74.6	0.63	-	84.6	0.087	12.92	0.215	31.6	62.2
18			0.13	74.5	0.67	-	84.4	0.089	12.91	0.206	31.3	62.4
19			0.15	74.6	0.71	-	84.0	0.086	12.49	0.131	30.4	61.5
20	649.272	0.140	0.15	74.5	0.59	98	83.8	0.087	11.54	0.069	30.2	61.2
21			0.16	74.5	0.59	-	83.6	0.086	12.15	0.109	29.9	61.2
22			0.17	74.5	0.70	-	83.5	0.085	11.56	0.072	29.3	60.8
23			0.17	74.4	0.63	-	83.3	0.086	10.93	0.087	28.7	60.3
24			0.18	74.4	0.70	-	83.1	0.084	10.75	0.068	28.1	59.9
25			0.16	74.4	0.70	-	83.1	0.084	9.95	0.046	27.6	59.4
26			0.16	74.4	0.67	-	83.0	0.083	9.92	0.057	27.4	59.2
27			0.19	74.4	0.63	-	82.9	0.082	9.51	0.077	27.6	59.0
28			0.18	74.3	0.66	-	82.8	0.081	9.24	0.102	27.4	58.6
29			0.18	74.3	0.68	-	82.7	0.080	8.97	0.079	27.2	58.5
30	650.666	0.139	0.20	74.3	0.61	99	82.7	0.080	8.73	0.107	26.5	58.5
31			0.20	74.3	0.60	-	82.7	0.077	8.47	0.082	26.1	58.1
32			0.20	74.3	0.69	-	82.7	0.078	7.93	0.102	25.8	57.6
33			0.21	74.3	0.63	-	83.3	0.076	7.62	0.085	25.9	57.2
34			0.21	74.3	0.70	-	84.0	0.077	7.55	0.067	26.1	57.6
35			0.20	74.3	0.60	-	84.8	0.077	7.08	0.061	25.9	57.4
36			0.20	74.2	0.60	-	85.4	0.075	6.64	0.081	26.3	56.5
37			0.22	74.2	0.63	-	86.9	0.075	4.20	0.104	25.8	59.2
38			0.22	74.2	0.72	-	88.2	0.086	3.28	0.382	25.8	59.2

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.24	74.2	0.77	-	88.6	0.099	4.19	0.540	25.8	59.2
40	652.064	0.140	0.20	74.3	0.81	103	87.2	0.092	5.88	0.441	25.8	59.2
41			0.23	74.3	0.74	-	85.6	0.089	11.61	1.114	23.7	66.6
42			0.23	74.3	0.85	-	85.3	0.091	11.70	0.669	26.8	66.4
43			0.22	74.3	0.79	-	85.2	0.092	12.57	0.688	26.1	67.8
44			0.19	74.3	0.80	-	85.1	0.094	12.51	0.814	26.0	67.5
45			0.20	74.3	0.82	-	84.9	0.093	12.81	0.873	26.2	66.9
46			0.21	74.2	0.90	-	84.8	0.095	12.99	0.984	26.1	67.1
47			0.24	74.2	0.90	-	84.7	0.095	13.27	1.078	26.1	67.3
48			0.23	74.3	0.81	-	84.5	0.094	13.00	0.917	26.3	66.7
49			0.23	74.3	0.91	-	84.4	0.093	12.56	0.608	26.5	65.8
50	653.455	0.139	0.24	74.3	0.91	104	84.2	0.094	12.31	0.580	27.0	65.7
51			0.23	74.2	0.83	-	84.1	0.094	12.30	0.737	27.1	65.5
52			0.25	74.3	0.88	-	83.8	0.095	12.61	0.834	27.2	65.5
53			0.24	74.3	0.84	-	83.7	0.096	12.78	0.892	27.2	65.5
54			0.24	74.3	0.81	-	83.6	0.097	13.03	0.983	27.2	65.7
55			0.23	74.3	0.85	-	83.3	0.097	13.33	0.988	27.0	65.8
56			0.24	74.3	0.85	-	83.4	0.098	13.65	1.005	26.9	66.0
57			0.26	74.3	0.85	-	83.1	0.100	13.93	1.039	26.5	66.2
58			0.26	74.3	0.83	-	83.1	0.100	14.57	0.942	26.2	66.7
59			0.28	74.3	0.91	-	83.0	0.102	14.93	0.881	25.7	66.9
60	654.859	0.140	0.25	74.3	0.85	102	83.0	0.103	15.51	0.994	25.5	67.3
61			0.27	74.3	0.83	-	82.9	0.102	15.40	1.466	25.2	67.5
62			0.26	74.4	0.84	-	82.9	0.101	15.21	1.721	25.2	67.3
63			0.26	74.4	0.84	-	82.9	0.101	15.23	1.718	25.0	67.3
64			0.30	74.3	0.92	-	82.8	0.101	15.24	1.698	25.0	67.1
65			0.30	74.3	0.83	-	82.7	0.100	15.20	1.644	24.8	67.1
66			0.29	74.4	0.86	-	82.8	0.100	15.19	1.606	24.7	66.9
67			0.30	74.5	0.85	-	82.6	0.100	15.17	1.577	24.6	66.6
68			0.29	74.6	0.86	-	82.6	0.099	15.13	1.597	24.6	66.6
69			0.29	74.6	0.87	-	82.6	0.099	15.10	1.573	24.6	66.4
70	656.220	0.136	0.30	74.6	0.87	99	82.6	0.099	15.00	1.551	24.3	66.0
71			0.29	74.7	0.98	-	82.6	0.100	14.91	1.571	24.3	65.8
72			0.31	74.6	0.91	-	82.5	0.100	14.84	1.576	24.1	65.7
73			0.30	74.6	0.90	-	82.4	0.100	14.83	1.605	24.1	65.5
74			0.32	74.6	0.99	-	82.5	0.100	14.75	1.489	23.8	65.3
75			0.33	74.6	0.97	-	82.3	0.100	14.64	1.451	23.6	65.1
76			0.32	74.5	0.93	-	82.3	0.100	14.64	1.379	23.4	64.8
77			0.34	74.5	1.00	-	82.3	0.099	14.71	1.186	23.3	64.6

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.36	74.5	0.95	-	82.3	0.099	14.71	1.050	23.0	64.2
79			0.36	74.5	1.00	-	82.3	0.098	14.26	0.833	22.8	63.5
80	657.582	0.136	0.35	74.5	1.02	99	82.1	0.097	13.69	0.647	22.8	62.8
81			0.37	74.5	1.03	-	82.1	0.095	13.27	0.567	22.7	62.1
82			0.37	74.6	1.00	-	82.2	0.095	12.84	0.467	23.0	61.7
83			0.39	74.5	0.98	-	82.1	0.094	12.73	0.373	23.2	61.3
84			0.38	74.5	0.96	-	82.2	0.092	12.22	0.207	23.1	60.8
85			0.38	74.5	1.00	-	82.4	0.092	11.76	0.152	23.2	60.3
86			0.36	74.5	1.04	-	82.6	0.090	11.31	0.121	23.3	59.5
87			0.37	74.5	0.99	-	82.7	0.089	10.79	0.095	23.4	58.8
88			0.37	74.4	1.03	-	82.9	0.089	10.55	0.080	23.5	58.3
89			0.39	74.4	1.05	-	83.0	0.087	10.38	0.087	23.6	57.9
90	658.969	0.139	0.41	74.5	1.11	100	83.2	0.087	9.84	0.066	23.7	57.4
91			0.39	74.5	1.10	-	83.2	0.085	9.45	0.041	23.7	56.7
92			0.38	74.5	1.05	-	83.3	0.085	8.97	0.033	23.5	56.1
93			0.39	74.6	1.02	-	83.3	0.084	8.49	0.028	23.6	55.4
94			0.39	74.6	1.08	-	83.5	0.083	8.12	0.026	23.8	55.0
95			0.39	74.6	1.09	-	83.5	0.083	7.89	0.024	24.0	54.7
96			0.40	74.6	1.05	-	83.6	0.082	7.71	0.026	24.0	54.3
97			0.39	74.6	1.10	-	83.6	0.081	7.41	0.030	24.0	54.0
98			0.39	74.5	1.10	-	83.6	0.080	7.13	0.034	24.0	53.4
99			0.40	74.5	1.09	-	83.6	0.079	6.73	0.052	24.1	53.1
100	660.405	0.144	0.40	74.6	1.03	102	83.8	0.078	6.63	0.063	24.3	52.7
101			0.39	74.6	1.05	-	83.8	0.078	6.52	0.072	24.5	52.5
102			0.38	74.6	1.05	-	83.8	0.077	6.40	0.086	24.7	52.3
103			0.39	74.6	1.03	-	83.8	0.076	6.29	0.110	24.8	52.2
104			0.40	74.5	1.05	-	83.8	0.075	6.18	0.128	25.0	51.8
105			0.41	74.5	1.01	-	83.8	0.075	5.97	0.114	25.0	51.6
106	661.277	0.145	0.40	74.5	1.01	103	83.8	0.074	5.77	0.132	25.2	51.4
Avg/Tot	14.806	0.140	0.26	74.5	0.82	101	83.8	0.086	10.50	0.517	27.64	60.829

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 8

Technician: SJB

Date: 6/9/2023

Elapsed Time (min)	Particulate Sampling Data						
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	242.910		0.40	84.3	1.00		82.94
1			0.40	84.2	1.00	-	83.61
2			0.40	84.0	1.00	-	84.20
3			0.40	84.0	1.00	-	84.96
4			0.40	83.8	1.00	-	85.47
5			0.40	84.0	1.00	-	85.57
6			0.40	84.5	1.00	-	85.58
7			0.40	85.0	1.00	-	85.43
8			0.40	85.4	1.00	-	85.35
9			0.40	85.9	1.00	-	85.50
10	244.182	0.127	0.40	86.4	1.00	95	85.35
11			0.40	86.7	1.00	-	85.40
12			0.40	87.2	1.00	-	85.38
13			0.40	87.6	1.00	-	85.38
14			0.40	87.4	1.00	-	85.22
15			0.40	87.0	1.00	-	85.01
16			0.40	86.9	1.00	-	84.95
17			0.40	86.4	1.00	-	84.63
18			0.40	86.0	1.00	-	84.38
19			0.40	85.7	1.00	-	84.02
20	245.463	0.128	0.40	85.4	1.00	97	83.77
21			0.40	85.2	1.00	-	83.64
22			0.40	85.3	1.00	-	83.54
23			0.40	85.4	1.00	-	83.33
24			0.40	85.3	1.00	-	83.14
25			0.40	85.3	1.00	-	83.07
26			0.40	85.3	1.00	-	83.01
27			0.40	85.3	1.00	-	82.92
28			0.40	85.2	1.00	-	82.82
29			0.40	85.1	1.00	-	82.71
30	246.782	0.132	0.40	85.2	1.00	101	82.65
31			0.40	85.2	1.00	-	82.75

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 23-161

Model: 1.7R

Tracking #: 135

Run #: 8

Technician: SJB

Date: 6/9/2023

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.40	85.1	1.00	-	82.72
33			0.40	85.0	1.00	-	83.28
34			0.40	84.8	1.00	-	84.02
35			0.40	84.8	1.00	-	84.82
36			0.40	84.7	1.00	-	85.38
37			0.40	85.6	1.00	-	86.91
38			0.40	86.2	1.00	-	88.25
39			0.40	86.8	1.00	-	88.64
40	248.068	0.129	0.40	86.9	1.00	103	87.23
41			0.40	85.6	1.00	-	85.56
42			0.40	85.1	1.00	-	85.28
43			0.40	84.9	1.00	-	85.22
44			0.40	84.9	1.00	-	85.08
45			0.40	84.7	1.00	-	84.91
46			0.40	84.6	1.00	-	84.83
47			0.40	84.5	1.00	-	84.75
48			0.40	84.5	1.00	-	84.50
49			0.40	84.4	1.00	-	84.36
50	249.350	0.128	0.40	84.3	1.00	103	84.23
51			0.40	84.2	1.00	-	84.07
52			0.40	84.0	1.00	-	83.78
53			0.40	83.9	1.00	-	83.69
54			0.40	83.8	1.00	-	83.56
55			0.40	83.8	1.00	-	83.34
56			0.40	83.7	1.00	-	83.36
57			0.40	83.7	1.00	-	83.13
58			0.40	83.6	1.00	-	83.09
59			0.40	83.6	1.00	-	83.03
60	250.662	0.131	0.40	83.6	1.00	103	82.99
Avg/Tot	7.752	0.129	0.40	85.1	1.00	100	84.4

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
0	78.0	81.5	80.4	81.3	79.4	80.1	N/A	
1	84.8	81.5	80.4	81.3	79.4	81.5	N/A	
2	96.9	81.5	80.9	81.3	79.5	84.0	N/A	
3	109.3	81.5	82.5	81.5	79.9	86.9	N/A	
4	128.9	81.5	85.4	81.9	80.6	91.7	N/A	
5	151.7	81.6	89.5	82.7	81.8	97.4	N/A	
6	195.2	81.6	94.8	83.9	83.4	107.8	N/A	
7	247.7	81.8	101.4	85.4	85.4	120.3	N/A	
8	296.5	82.0	108.9	87.3	88.0	132.5	N/A	
9	351.1	82.4	116.8	89.8	91.0	146.2	N/A	
10	401.6	82.9	124.6	92.7	94.6	159.3	N/A	
11	436.1	83.6	132.0	96.4	98.5	169.3	N/A	
12	464.5	84.4	139.0	100.6	102.9	178.3	N/A	
13	506.4	85.6	146.0	105.2	107.6	190.2	N/A	
14	547.7	86.8	153.4	110.3	112.9	202.2	N/A	
15	581.4	88.5	161.0	115.9	118.3	213.0	N/A	
16	609.8	90.3	168.5	121.9	124.3	223.0	N/A	
17	633.6	92.8	176.8	128.1	130.8	232.4	N/A	
18	654.5	95.6	185.2	134.5	137.9	241.5	N/A	
19	673.1	99.0	193.6	141.4	145.2	250.5	N/A	
20	686.7	102.6	201.9	148.6	152.8	258.5	N/A	
21	698.4	106.5	210.1	155.9	160.2	266.2	N/A	
22	709.0	110.8	218.5	163.5	167.6	273.9	N/A	
23	713.7	115.2	227.4	171.4	175.1	280.5	N/A	
24	718.9	119.6	236.4	179.6	182.6	287.4	N/A	
25	720.1	124.5	245.2	187.8	190.4	293.6	N/A	
26	717.1	129.4	253.5	196.0	198.4	298.9	N/A	
27	711.6	134.1	261.5	204.1	206.3	303.5	N/A	
28	703.5	139.5	269.3	212.2	214.1	307.7	N/A	
29	699.0	144.5	276.7	221.4	221.9	312.7	N/A	
30	688.9	149.8	285.0	229.7	229.6	316.6	N/A	
31	679.9	155.3	293.2	237.2	237.0	320.5	N/A	
32	669.1	160.6	301.1	244.6	244.1	323.9	N/A	
33	658.9	165.9	308.4	251.5	251.2	327.2	N/A	
34	649.5	171.1	315.2	258.5	258.2	330.5	N/A	
35	639.0	176.2	321.8	264.9	265.0	333.4	N/A	
36	629.8	181.2	328.0	271.5	271.4	336.4	N/A	
37	616.7	186.5	334.6	279.4	278.1	339.1	N/A	
38	595.6	191.8	341.3	286.3	284.8	340.0	N/A	
39	591.0	196.9	345.7	292.1	290.9	343.3	N/A	
40	612.9	202.3	348.2	297.3	296.3	351.4	N/A	
41	635.8	207.3	348.7	302.1	300.8	358.9	N/A	
42	656.2	211.9	348.2	307.0	305.0	365.7	N/A	
43	679.2	216.2	346.9	310.7	307.6	372.1	N/A	
44	701.2	219.9	345.3	313.4	310.4	378.0	N/A	
45	720.4	223.8	343.8	316.2	312.7	383.4	N/A	
46	738.4	226.9	342.3	317.4	313.6	387.7	N/A	
47	752.3	230.2	341.3	319.3	314.3	391.5	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
48	762.5	233.8	340.9	320.6	315.5	394.7	N/A	
49	769.6	237.7	341.0	322.3	316.9	397.5	N/A	
50	773.7	241.6	341.2	323.4	317.9	399.6	N/A	
51	776.7	245.5	341.9	324.5	319.2	401.6	N/A	
52	780.8	249.7	342.9	326.4	320.2	404.0	N/A	
53	784.3	253.9	344.3	327.6	321.3	406.3	N/A	
54	790.4	258.0	346.1	328.8	322.2	409.1	N/A	
55	799.0	262.0	348.6	329.9	323.2	412.5	N/A	
56	808.6	265.7	351.7	331.3	324.2	416.3	N/A	
57	816.7	270.0	355.5	332.6	325.3	420.0	N/A	
58	828.8	274.2	359.7	333.8	326.3	424.6	N/A	
59	844.5	278.0	364.3	335.0	327.5	429.9	N/A	
60	863.2	282.0	369.3	336.0	328.8	435.9	N/A	
61	883.8	286.3	374.6	337.4	330.0	442.4	N/A	
62	902.8	290.2	380.4	338.6	331.4	448.7	N/A	
63	915.3	294.5	386.6	340.1	332.7	453.8	N/A	
64	928.1	298.9	393.3	341.6	334.0	459.2	N/A	
65	936.5	303.2	400.4	343.3	335.8	463.8	N/A	
66	942.8	307.6	408.0	345.2	337.4	468.2	N/A	
67	946.1	311.7	416.0	347.2	339.4	472.1	N/A	
68	946.8	316.3	424.4	349.0	341.5	475.6	N/A	
69	949.7	321.0	432.9	351.0	343.7	479.6	N/A	
70	949.3	324.9	441.2	353.0	345.8	482.8	N/A	
71	947.2	329.2	449.3	355.2	348.0	485.8	N/A	
72	944.1	333.7	457.3	357.8	350.8	488.7	N/A	
73	941.0	338.6	465.5	360.6	353.8	491.9	N/A	
74	935.6	343.0	473.5	363.2	357.0	494.5	N/A	
75	934.3	347.2	481.1	366.3	360.4	497.9	N/A	
76	930.8	351.4	488.4	369.1	363.6	500.6	N/A	
77	929.5	356.1	495.3	372.0	367.0	504.0	N/A	
78	927.7	360.6	501.7	375.2	370.5	507.1	N/A	
79	924.8	364.7	507.2	378.6	373.9	509.8	N/A	
80	918.2	369.0	512.2	382.0	377.6	511.8	N/A	
81	910.3	373.4	517.0	385.6	381.1	513.5	N/A	
82	902.4	377.6	521.6	389.1	384.5	515.0	N/A	
83	893.7	381.9	526.2	392.4	387.8	516.4	N/A	
84	884.6	385.8	530.6	395.6	391.1	517.6	N/A	
85	873.8	390.1	534.7	399.4	394.8	518.6	N/A	
86	861.7	394.2	538.8	402.8	398.0	519.1	N/A	
87	849.1	397.7	543.2	406.5	401.3	519.5	N/A	
88	836.7	401.8	547.3	409.6	404.7	520.0	N/A	
89	828.5	404.9	551.3	412.7	407.9	521.1	N/A	
90	818.0	408.3	554.8	415.8	410.9	521.5	N/A	
91	805.1	411.2	557.9	418.7	413.7	521.3	N/A	
92	793.0	413.9	560.4	421.0	416.7	521.0	N/A	
93	781.2	416.9	562.5	423.2	419.2	520.6	N/A	
94	770.0	419.3	563.8	425.1	421.4	519.9	N/A	
95	756.8	422.2	564.5	426.9	423.3	518.7	N/A	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
96	744.6	423.9	564.6	428.4	425.1	517.3	N/A
97	734.7	426.4	564.0	429.5	426.5	516.2	N/A
98	724.0	427.8	563.0	430.3	427.6	514.6	N/A
99	712.9	429.3	561.8	431.1	428.5	512.7	N/A
100	703.5	430.9	559.9	431.8	429.1	511.0	N/A
101	693.3	433.0	557.8	431.6	429.4	509.0	N/A
102	683.1	434.1	555.3	431.9	429.6	506.8	N/A
103	673.3	435.8	552.6	431.7	429.9	504.7	N/A
104	663.6	436.6	549.7	431.3	429.4	502.1	N/A
105	652.8	438.0	546.7	430.8	429.0	499.5	N/A
106	641.2	439.1	543.5	429.8	428.5	496.4	N/A
Average	705.3	252.9	360.5	291.4	288.7	380	N/A



## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 8

Job #: 23-161  
 Tracking #: 135  
 Technician: SJB  
 Date: 6/9/2023

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0177	179.8	183.1	3.3
	<b>B</b>	H0178	179.2	182.4	3.2
	<b>C - 1st Hour</b>	H0179	180.6	182.5	1.9
	<b>Amb</b>	H0159	93.3	93.4	0.1
<b>Probes</b>	<b>A</b>	11A	116864.2	116864.3	0.1
	<b>B</b>	11B	117338.6	117338.7	0.1
	<b>C - 1st Hour</b>	11C	116184.9	116185.0	0.1
<b>O-rings</b>	<b>A</b>	11A	3423.5	3423.7	0.2
	<b>B</b>	11B	4233.9	4234.0	0.1
	<b>C - 1st Hour</b>	11C	3588.4	3588.7	0.3

**Placed in Dessicator on:** 6/12 - 10:30

**Balance Audit (mg):** 100.0 100.0 100.0 100.0

*Undesiccated                      Dessicated                      Dessicated                      Desiccated*

<b>Filters</b>	<b>A</b>	183.3	6/9 15:51	183.2	6/14 10:50	183.1	6/15 12:38		
	<b>B</b>	182.6	6/9 15:51	182.5	6/14 10:50	182.4	6/15 12:38		
	<b>C - 1st Hour</b>	182.5	6/9 12:55	182.4	6/14 10:51	182.5	6/15 12:39		
	<b>Amb</b>	93.3	6/9 15:52	93.3	6/14 10:51	93.4	6/15 12:39		
<b>Probes</b>	<b>A</b>			116864.4	6/14 11:00	116864.3	6/15 12:50		
	<b>B</b>			117338.8	6/14 11:00	117338.5	6/15 12:50	117338.7	6/16 8:58
	<b>C - 1st Hour</b>			116185.1	6/14 11:00	116184.8	6/15 12:50	116185.0	6/16 8:58
<b>O-Rings</b>	<b>A</b>			3423.6	6/14 10:39	3423.7	6/15 12:27		
	<b>B</b>			4233.9	6/14 10:40	4234.0	6/15 12:27		
	<b>C - 1st Hour</b>			3588.5	6/14 10:40	3588.9	6/15 12:28	3588.7	6/16 8:57

<b>Train A Aggregate, mg:</b>	<b>3.6</b>
<b>Train B Aggregate, mg:</b>	<b>3.4</b>
<b>Train C Aggregate, mg:</b>	<b>2.3</b>
<b>Ambient Aggregate, mg:</b>	<b>0.1</b>

# ASTM E2515 - TX Filters

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
H0110	188.3	188.2	-	-	SB	22-790	#3
H0111	188.1	187.9	-	-	SB	↓	↓
H0112	187.4	187.5	-	-	SB	22-790	#4
H0113	187.7	187.9	-	-	SB	↓	↓
H0114	188.1	188.1	-	-	SB	↓	↓
H0115	188.5	188.5	-	-	SB	↓	↓
H0116	188.4	188.4	-	-	SB	22-835	#1
H0117	187.3	187.2	-	-	SB	↓	↓
H0118	186.6	188.6	-	-	SB	↓	↓
H0119	187.0	187.1	-	-	SB	↓	#2
H0120	187.5	187.6	-	-	SB	↓	↓
H0121	188.4	188.4	-	-	SB	↓	↓
H0122	188.4	188.3	-	-	SB	↓	#3
H0123	188.8	188.7	-	-	SB	↓	↓
H0124	188.6	188.5	-	-	SB	↓	↓
H0125	186.5	186.5	-	-	SB	↓	#4
H0126	186.9	187.1	-	-	SB	↓	↓
H0127	186.7	186.7	-	-	SB	↓	↓

Weight 1 Date/Time:
5/26-16:00
Weight 2 Date/Time:
5/31-8:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
H0128	187.4	187.5	-	-	SB	22-835	#5
H0129	187.3	187.4	-	-	SB	↓	↓
H0130	187.9	187.9	-	-	SB	↓	↓
H0131	188.4	188.4	-	-	SB	↓	#6
H0132	188.1	188.1	-	-	SB	↓	↓
H0133	188.0	188.0	-	-	SB	↓	↓
H0134	188.4	188.5	-	-	SB	23-161	#1
H0135	189.2	189.3	-	-	SB	↓	↓
H0136	188.7	188.7	-	-	SB	↓	↓
H0137	188.0	188.1	-	-	SB	↓	#2
H0138	187.0	187.1	-	-	SB	↓	↓
H0139	187.6	187.5	-	-	SB	↓	↓
H0140	187.4	187.5	-	-	SB	↓	#3
H0141	188.0	187.8	-	-	SB	↓	↓
H0142	188.1	188.1	-	-	SB	↓	↓
H0143	188.8	188.8	-	-	SB	↓	#4
H0144	188.7	188.7	-	-	SB	↓	↓
H0145	188.6	188.7	-	-	SB	↓	↓

Weight 1 Date/Time:
5/26-16:00
Weight 2 Date/Time:
5/31-8:30
Weight 3 Date/Time:
Weight 4 Date/Time:

# ASTM E2515 - PTFE Filters

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
H00146	90.8	90.9	-	-	A	22-835	#1
H00147	90.9	91.1	-	-	A		#2
H00148	89.6	89.8	-	-	A		#3
H00149	90.4	90.6	-	-	A		#4
H00150	89.3	89.5	-	-	A		#5
H00151	X 89.5	89.6	-	-	A		#6
H00152	90.0	90.2	-	-	A	23-111	#1
H00153	95.4	95.3	-	-	A		#2
H00154	95.5	95.6	-	-	A		#3
H00155	94.9	94.9	-	-	A		#4
H00156	95.7	95.6	-	-	A		#5
H00157	96.7	96.5	-	-	A		#6
H00158	94.6	94.6	-	-	A		#7
H00159	93.4	93.3	-	-	A		#8
H00160	87.9	87.8	-	-	A		
H00161	89.6	89.9	-	-	A		
H00162	89.7	89.8	-	-	A		
H00163	96.8	96.8	-	-	A		

Weight 1 Date/Time:
12/14/22 1400
Weight 2 Date/Time:
12/15/22 0900
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
H00164	187.6	187.7	-	-	A	23-161	#3
H00165	179.3	179.2	-	-	A		↓
H00166	181.1	180.9	-	-	A		#5
H00167	181.0	181.0	-	-	A		↓
H00168	178.6	178.4	-	-	A		↓
H00169	179.1	179.0	-	-	A		#6
H00170	180.1	180.0	-	-	A		↓
H00171	192.3	192.4	-	-	A		↓
H00172	190.8	190.8	-	-	A		#5
H00173	191.2	191.2	-	-	A		↓
H00174	183.6	183.8	-	-	A		#7
H00175	178.6	178.7	-	-	A		↓
H00176	181.1	181.2	-	-	A		↓
H00177	180.0	179.8	-	-	A		#8
H00178	179.2	179.2	-	-	A		↓
H00179	180.6	180.6	-	-	A		↓
H00180	181.1	181.1	-	-	A		
H00181	187.9	188.0	-	-	A		

Weight 1 Date/Time:
6/2/23 1400
Weight 2 Date/Time:
6/3/23 0800
Weight 3 Date/Time:
Weight 4 Date/Time:

# Probe ASTM E2515 - O-Ring Samples 1-10

Date:	5/1/23	5/2/23	5/3/23				
Time:	1730	1930	0906				
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	115626.3	115626.8	115627.0	-	A	23-193	#1
1B	115901.7	118901.9	-	-	B		
1C	116432.7	116432.6	-	-	C		
2A	116056.6	116056.8	-	-	A	23-194	#1
2B	116173.3	116173.7	116173.6	-	B		
2C	116429.2	116429.1	-	-	C		
3A	115879.9	115880.0	-	-	A	23-114	#1
3B	116119.8	116120.0	-	-	B		
3C	116617.2	116617.3	-	-	C		
4A	116022.2	116022.6	116022.4	-	A	23-161	#1
4B	116181.5	116181.8	116181.8	-	B		
4C	116997.0	116997.1	-	-	C		
5A	116756.9	116757.0	-	-	A	23-161	#2
5B	116875.2	116875.4	-	-	B		
5C	115854.7	115855.0	115855.0	-	C		

Date:	5/31/23	6/1/23	6/2/23	6/3/23			
Time:	10:00	15:30	11:00	0800			
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A	116381.9	116382.0	-	-	A	23-161	#3
6B	115953.3	115953.4	-	-	B		
6C	115127.9	115127.9	-	-	C		
7A	116557.4	116557.4	-	-	A	23-161	#4
7B	117128.0	117128.2	-	-	B		
7C	116550.7	116550.7	-	-	C		
8A	116632.8	116633.0	-	-	A	23-161	#5
8B	116664.8	116664.9	-	-	B		
8C	116662.7	116662.3	116662.7	116662.5	C		
9A	116530.1	116530.0	-	-	A	23-161	#6
9B	117737.8	117737.7	-	-	B		
9C	116602.9	116603.0	-	-	C		
10A	116645.5	116645.5	-	-	A	23-161	#7
10B	117753.5	117753.6	-	-	B		
10C	116727.8	116727.8	-	-	C		

# ASTM E2515 - Probe Samples 11-20

Date:	5/31/23	6/1/23	6/2/23	6/3/23			
Time:	10:00	15:30	11:00	08:00			
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	116864.4	116864.2	-	<	A	23-161	#8
11B	117338.8	117338.6	-	-	A		
11C	116184.9	116184.9	-	-	A		
12A	116704.7	116704.4	116704.9	116704.9	A		
12B	117770.7	117770.6	-	-	A		
12C	117170.7	117170.6	-	-	A		
13A	117313.8	117313.4	117313.9	117313.8	A		
13B	116941.0	116940.5	116941.2	116941.0	A		
13C	115649.5	115649.6	-	-	A		
14A	116632.5	116632.5	116632.7	-	A		
14B	116618.2	-	116618.4	-	A		
14C	116529.9	-	116530.1	-	A		
15A	117238.7	-	117238.9	-	A		
15B	116751.6	-	116751.8	-	A		
15C	116846.7	-	116846.9	-	A		

Date:							
Time:							
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A							
16B							
16C							
17A							
17B							
17C							
18A							
18B							
18C							
19A							
19B							
19C							
20A							
20B							
20C							

O-Ring

# ASTM E2515 - Probe Samples 1-10

Date:	5/1/23	5/2/23					
Time:	17:00	1400					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	3566.7	3566.9	-	-	A	23-143	#1
1B	3555.1	3555.83	-	-	A		
1C	4166.88	4167.0	-	-	A		
2A	3552.7	3552.8	-	-	A	23-144	#1
2B	3571.8	3571.9	-	-	A		
2C	3389.8	3389.8	-	-	A		
3A	3579.6	3579.4	-	-	A	23-114	#1
3B	3568.3	3568.3	-	-	A		
3C	3677.0	3621.9	-	-	A		
4A	3374.9	3374.9	-	-	A	23-161	#1
4B	3579.4	3579.3	-	-	A		
4C	3371.3	3371.4	-	-	A		
5A	3535.2	3535.4	-	-	A	23-161	#2
5B	3531.3	3531.4	-	-	A		
5C	3375.2	3375.4	-	-	A		

Date:	5/30/23	5/31/23					
Time:	16:00	8:00					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A	3614.1	3614.2	-	-	SB	23-161	#3
6B	3396.5	3396.4	-	-	SB		
6C	3401.4	3401.2	-	-	SB		
7A	3572.1	3572.0	-	-	SB	23-161	#4
7B	3522.9	3523.1	-	-	SB		
7C	3406.8	3406.7	-	-	SB		
8A	3551.5	3551.3	-	-	SB	23-161	#5
8B	3357.2	3357.2	-	-	SB		
8C	3586.3	3586.2	-	-	SB		
9A	3580.6	3580.6	-	-	SB	23-161	#6
9B	3527.5	3527.5	-	-	SB		
9C	3430.5	3430.7	-	-	SB		
10A	3360.9	3360.7	-	-	SB	23-161	#7
10B	3570.7	3570.6	-	-	SB		
10C	3365.9	3366.0	-	-	SB		

# ASTM E2515 - O-Ring Samples 11-20

Date:	5/30/23	5/31/23					
Time:	16:00	8:00					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	3423.5	3423.5	-	-	SB	23-61	#3
11B	4233.8	4233.9	-	-	SB		
11C	3588.5	3588.4	-	-	SB		
12A	3586.1	3586.2	-	-	SB		
12B	3550.5	3550.7	-	-	SB		
12C	3616.2	3616.3	-	-	SB		
13A	3595.7	3595.7	-	-	SB		
13B	3641.9	3641.9	-	-	SB		
13C	4408.9	4408.9	-	-	SB		
14A	3366.2	3366.4	-	-	SB		
14B	3341.2	3341.3	-	-	SB		
14C	3445.2	3445.2	-	-	SB		
15A	3569.5	3569.5	-	-	SB		
15B	3570.8	3570.9	-	-	SB		
15C	3396.5	3396.5	-	-	SB		

Date:							
Time:							
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A							
16B							
16C							
17A							
17B							
17C							
18A							
18B							
18C							
19A							
19B							
19C							
20A							
20B							
20C							

## Sample Calculations – ASTM E3053 & E2515

Client: SBI  
 Model: 1.7R  
 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.

$M_{Fdb}$  – 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<sub>Fldb</sub> – Weight of test fuel load, dry basis, lb (kg)**

ASTM E3053 equation (1)

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

Where,

- M<sub>FLnwb</sub> = Weight of each test fuel piece, n, in test fuel load per 8.4.1, wet basis, lb (kg)
- MC<sub>FLn</sub> = 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 <sub>FLnwb</sub>	MC <sub>FLn</sub>	(M <sub>FLnwb</sub> )(100/(100 + MC <sub>FLn</sub> ))	
1	3.35	19.9	3.348 (100) / ( 100+ 19.9 )) =	2.79
2	2.23	23.3	2.231 (100) / ( 100+ 23.3 )) =	1.81
3	3.32	22.0	3.324 (100) / ( 100+ 22 )) =	2.72
4	2.19	19.1	2.187 (100) / ( 100+ 19.1 )) =	1.84
5	3.65	21.7	3.652 (100) / ( 100+ 21.7 )) =	3.00
6	0.00	NA	N/A	-
7	N/A	N/A	N/A	-
			SUM	12.16 lbs
M <sub>Fldb</sub> =	<b>12.16</b>	lbs		
M <sub>Fldb</sub> =	<b>5.52</b>	kg		

**M<sub>SUdb</sub> – Weight of start-up fuel, dry basis, lb (kg)**

ASTM E3053 equation (2)

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

Where,

M<sub>SUwb</sub> = Total weight of start-up fuel pieces, wet basis, lb (kg)

MC<sub>SU</sub> = Average fuel moisture of the piece(s) from which start-up fuel was split, % dry basis

Sample Calculation:

$$M_{SUwb} = 4.35$$

$$MC_{SU} = 23.3$$

$$M_{SUdb} = 4.4 (100 / (100 + 23.3))$$

$$M_{SUdb} = \mathbf{3.53} \text{ lbs}$$

$$= \mathbf{1.60} \text{ kg}$$

**M<sub>Kdb</sub> - Weight of kindling, dry basis, lb (kg)**

ASTM E3053 equation (3)

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

Where,

M<sub>Kwb</sub> = Weight of kindling per 8.5.6, wet basis, lb (kg);

MC<sub>K</sub> = Average moisture of kindling (may be assumed 10%), % dry basis.

Sample calculation:

$$M_{Kwb} = 2.901$$

$$MC_K = 10.0$$

$$M_{Kdb} = 2.90 (100 / (100 + 10.0))$$

$$M_{Kdb} = \mathbf{2.64} \text{ lbs}$$

$$= \mathbf{1.20} \text{ kgs}$$

**M<sub>FREHdb</sub> - 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<sub>RSUBdb</sub> = Weight of residual start-up fuel bed when high fire test load added, lb (kg)

M<sub>FLEHdb</sub> = Weight of unburned portion of test fuel load at the end of the high fire test run, lb (kg)

Sample calculation:

$$M_{RSUBdb} = 1.98$$

$$M_{FLEHdb} = 1.54$$

$$M_{FREHdb} = 1.98 + 1.54$$

$$M_{FREHdb} = 3.52 \text{ lbs}$$

$$= 1.60 \text{ kg}$$

**M<sub>TFBHdb</sub> - 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:

$$M_{Kdb} = 2.64$$

$$M_{SUdb} = 3.53$$

$$M_{FLdb} = 12.16$$

$$M_{FREHdb} = 3.52$$

$$M_{TFBHdb} = 2.64 + 3.53 + 12.16 - 3.52$$

$$= 14.81 \text{ lbs}$$

$$= 6.72 \text{ kg}$$

**BR<sub>H</sub>** – 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,

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

Sample calculation:

$$\begin{aligned} M_{FLdb} &= 12.16 \\ M_{FLEHdb} &= 1.54 \\ \theta_{H1} &= 71 \end{aligned}$$

$$BR_H = \frac{60 ( 12.16 - 1.54 )}{71}$$

$$\begin{aligned} BR_H &= \mathbf{8.98} \text{ lb/hr} \\ &= \mathbf{4.07} \text{ kg/hr} \end{aligned}$$

**$M_{TFBdb}$  - 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

$$\begin{aligned} M_{TFBdb} &= \text{N/A} - \text{N/A} \\ &= \text{N/A} \quad \text{lbs} \\ &= \text{N/A} \quad \text{kg} \end{aligned}$$

**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,

$\theta$  = 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

$\theta$  = N/A - Applicable to Low/Medium Fire Tests Only

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

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  
 $\Delta P^*$  = Velocity pressure in the dilution tunnel, in H<sub>2</sub>O  
 $T_s$  = 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<sub>2</sub>O; (in Hg = in H<sub>2</sub>O/13.6)  
 $M_s$  = \*\*The dilution tunnel wet molecular weight;  $M_s = 28.78$  assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$F_p = \frac{25.64}{27.79} = 0.923$$

$$V_s = 0.923 \times 85.49 \times 0.99 \times 0.391 \times \left( \left( \frac{100.0 + 460}{29.48 + \frac{-0.33}{13.6}} \right) \times 28.78 \right)^{1/2}$$

$$V_s = \mathbf{24.83} \text{ ft/s}$$

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

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



**Q<sub>sd</sub> – 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<sub>ws</sub> = Water vapor in gas stream, proportion by volume; assume 2%
- A = Cross sectional area of dilution tunnel, ft<sup>2</sup>
- T<sub>std</sub> = Standard absolute temperature, 528 °R
- P<sub>s</sub> = Absolute average gas static pressure in dilution tunnel, = P<sub>bar</sub> + P<sub>g</sub>, in Hg
- T<sub>s(avg)</sub> = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
- P<sub>std</sub> = Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 24.83 \times 0.3491 \times \frac{528}{100.0 + 460} \times \frac{29.48 + \frac{-0.33}{13.6}}{29.92}$$

Q<sub>sd</sub> = **28383.3** dscf/hr

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

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

Where:

- $K_1$  = 17.64 °R/in. Hg
- $V_m$  = Volume of gas sample measured at the dry gas meter, dcf
- $Y$  = Dry gas meter calibration factor, dimensionless
- $P_{bar}$  = Barometric pressure at the testing site, in. Hg
- $\Delta H$  = Average pressure differential across the orifice meter, in. H<sub>2</sub>O
- $T_m$  = Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train A:

$$V_{m(std)} = 17.64 \times 19.235 \times 1.023 \times \frac{( 29.48 + \frac{0.97}{13.6} )}{( 77.5 + 460 )}$$

$$V_{m(std)} = \mathbf{19.084} \text{ dscf}$$

Using equation for Train B:

$$V_{m(std)} = 17.64 \times 18.718 \times 1.019 \times \frac{( 29.48 + \frac{0.29}{13.6} )}{( 76.1 + 460 )}$$

$$V_{m(std)} = \mathbf{18.516} \text{ dscf}$$

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 19.81 \times 1.01 \times \frac{( \underline{29.48} + \frac{0.00}{13.6} )}{( 78.3 + 460 )}$$

$$V_{m(std)} = \mathbf{19.325} \text{ dscf}$$

**$m_n$  – Total Particulate Matter Collected, mg**

ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

$m_p$  = mass of particulate matter from probe, mg

$m_f$  = mass of particulate matter from filters, mg

$m_g$  = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A:

$$m_n = 0.1 + 1.6 + 0.5$$

$$m_n = 2.2 \text{ mg}$$

Using equation for Train B:

$$m_n = 0.1 + 1.4 + 0.4$$

$$m_n = 1.9 \text{ mg}$$

**C<sub>s</sub> - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf**  
ASTM E2515 equation (13)

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

Where:

- K<sub>2</sub> = Constant, 0.001 g/mg
- m<sub>n</sub> = Total mass of particulate matter collected in the sampling train, mg
- V<sub>m(std)</sub> = Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train A:

$$C_s = 0.001 \times \frac{2.2}{19.08}$$

$$C_s = \mathbf{0.00012} \text{ g/dscf}$$

For Train B

$$C_s = 0.001 \times \frac{1.9}{18.52}$$

$$C_s = \mathbf{0.00010} \text{ g/dscf}$$

For Ambient Train

$$C_r = 0.001 \times \frac{0.0}{19.33}$$

$$C_r = \mathbf{0.000000} \text{ g/dscf}$$

**E<sub>T</sub> – Total Particulate Emissions, g**

ASTM E2515 equation (15)

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

Where:

- C<sub>s</sub> = Concentration of particulate matter in tunnel gas, g/dscf
- C<sub>r</sub> = Concentration particulate matter room air, g/dscf
- Q<sub>std</sub> = Average dilution tunnel gas flow rate, dscf/hr
- θ = Total time of test run, minutes

Sample calculation:

For Train A

$$E_T = ( 0.000115 - 0.000000 ) \times 28383.3 \times 107 /60$$

$$E_T = \mathbf{5.84} \text{ g}$$

For Train B

$$E_T = ( 0.000103 - 0.000000 ) \times 28383.3 \times 107 /60$$

$$E_T = \mathbf{5.19} \text{ g}$$

Average

$$E = \mathbf{5.51} \text{ g}$$

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

$$7.5\% \text{ of the average} = 0.41$$

$$\text{Train A difference} = 0.32$$

$$\text{Train B difference} = 0.32$$

**PR - Proportional Rate Variation**

ASTM E2515 equation (16)

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

Where:

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

Sample calculation (for the first 10 minute interval of Train A):

$$PR = \left( \frac{107 \times 1.813 \times 24.83 \times (82.3 + 460) \times (77.5 + 460)}{10 \times 19.235 \times 24.76 \times (100.0 + 460) \times (76.9 + 460)} \right) \times 100$$

PR = **98** %

**PM<sub>RH</sub> - 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

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

Sample Calculation:

$$E_{TH} = 5.51$$

$$\theta_{H2} = 107$$

$$PM_{RH} = 60( 5.51 / 107 )$$

$$PM_{RH} = \mathbf{3.09} \text{ g/hr}$$

**PM<sub>FH</sub> - 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:

$$E_{TH} = 5.51$$

$$M_{TFBHdb} = 6.72$$

$$PM_{FH} = 5.51 / 6.72$$

$$= \mathbf{0.82} \text{ g/kg}$$

**PM<sub>R</sub> - Particulate emission rate for low or medium fire test runs, g/hr**

ASTM E3053 equation (12)

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

Where,

E<sub>T</sub> = Total particulate emissions for low or medium fire test runs from Test Method E2515, g

Sample Calculation:

E<sub>T</sub> = N/A - Applicable to Low/Medium Fire Tests Only

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

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

$$PM_{RH} = N/A \text{ g/hr}$$

**PM<sub>FH</sub> - 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<sub>T</sub> = N/A - Applicable to Low/Medium Fire Tests Only

M<sub>TFBdb</sub> = N/A - Applicable to Low/Medium Fire Tests Only

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

$$= N/A \text{ g/kg}$$



**Stack Loss Efficiency and CO emissions calculations are done in accordance with CSA B415.1, using the password protected excel spreadsheet provided with the test standard. No alterations or alternative calculations are used for determining efficiency or CO emissions. The following pages are a sample of the calculations page from the B415.1 Spreadsheet (V2\_4 - Dated April 15, 2010).**

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 06/06/23  
**Run:** 1  
**Control #:** 23-161  
**Test Duration:** 71 min

	HHV	LHV
Eff	68.83%	73.74%
Comb Eff	98.37%	98.37%
HT Eff	69.97%	74.96%
Output	53,954	kJ/h
Burn Rate	4.17	kg/h
Grams CO	121	g
Input	78,384	kJ/h
MC wet	17.50	
Averages	0.25	11.57

Note: In the "Input data", "Calc. % O<sub>2</sub>", "Fuel Properties", and "Mass Balance" columns, [e], [d], [g], [a], [b], [c], [h], [u], [w], [j], and [k] refer to their respective variables in Clauses 13.7.3 to 13.7.5.

Ultimate CO<sub>2</sub>  
 CO<sub>2-ult</sub> 20.77  
 F<sub>0</sub>  
 1.005

Overall Heating Efficiency: 68.83%  
 Combustion Efficiency: 98.37%  
 Heat Transfer Efficiency: 69.97%  
 Heat Output: 51,181 Btu/h  
 Heat Input: 74,356 Btu/h  
 Burn Duration: 1.18 h  
 Burn Rate: 9.19 lb/h  
 Stack Temp: 613.9 Deg. F

Air Fuel	Dry Molecular W
	Dry Moles Exhaus
	Air Fuel Ratio

53,954 kJ/h  
78,384 kJ/h

4.169 kg/h

323.3 Deg. C

INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat	Net	Air	Wet Wt
Elapsed	Weight	%	%	Excess	Total	Calc. %	Flue	Room	Eff	Transfer	Eff	Fuel	Now
Time	Remaining (kg)	CO [e]	CO <sub>2</sub> [d]	Air EA	O <sub>2</sub>	O <sub>2</sub> [g]	Gas (°C)	Temp (°C)	%	%	%	Ratio	Wt
0	5.98	0.13	4.85	317.3%	20.90	15.99	255.4	25.2	98.7%	57.9%	57.1%	23.7	5.98
1	5.90	0.10	2.63	661.8%	20.92	18.24	233.5	25.5	98.8%	38.6%	38.1%	43.4	5.90
2	5.80	0.08	3.32	511.6%	20.91	17.55	250.9	25.9	99.5%	45.2%	45.0%	34.8	5.80
3	5.72	0.17	9.36	118.0%	20.86	11.42	265.6	26.2	98.8%	71.6%	70.7%	12.4	5.72
4	5.66	0.15	8.10	151.7%	20.87	12.70	265.9	25.9	98.8%	69.0%	68.2%	14.3	5.66
5	5.60	0.11	8.25	148.6%	20.87	12.57	267.8	25.9	99.3%	69.2%	68.7%	14.1	5.60
6	5.53	0.11	8.62	138.1%	20.87	12.20	272.7	26.4	99.3%	69.6%	69.2%	13.5	5.53
7	5.45	0.13	9.11	125.0%	20.87	11.69	276.9	27.1	99.2%	70.3%	69.7%	12.8	5.45
8	5.38	0.12	8.16	150.9%	20.87	12.65	274.4	27.8	99.2%	68.6%	68.0%	14.2	5.38
9	5.32	0.14	7.84	160.2%	20.88	12.96	272.1	27.8	98.9%	68.0%	67.2%	14.8	5.32
10	5.25	0.14	7.98	155.8%	20.88	12.82	270.3	27.8	98.9%	68.5%	67.7%	14.5	5.25
11	5.19	0.15	8.12	151.1%	20.87	12.68	269.2	28.3	98.8%	69.0%	68.2%	14.2	5.19
12	5.11	0.16	8.86	130.3%	20.87	11.93	271.5	28.0	98.8%	70.3%	69.5%	13.1	5.11
13	5.04	0.16	9.50	115.2%	20.86	11.29	277.1	27.8	98.9%	71.0%	70.3%	12.2	5.04
14	4.95	0.15	10.02	104.4%	20.86	10.77	285.5	28.1	99.0%	71.3%	70.6%	11.6	4.95
15	4.86	0.15	10.72	91.1%	20.85	10.06	295.8	28.2	99.0%	71.6%	70.9%	10.8	4.86
16	4.77	0.18	11.48	78.2%	20.85	9.28	304.0	28.2	98.9%	72.1%	71.3%	10.1	4.77
17	4.68	0.16	11.38	80.0%	20.85	9.39	309.3	27.4	99.0%	71.6%	70.9%	10.2	4.68
18	4.60	0.21	11.51	77.3%	20.85	9.23	311.1	27.3	98.7%	71.6%	70.7%	10.0	4.60
19	4.50	0.40	11.52	74.3%	20.85	9.13	311.5	27.1	97.3%	71.5%	69.6%	9.8	4.50
20	4.41	0.33	11.99	68.7%	20.84	8.69	311.0	27.4	97.9%	72.2%	70.7%	9.5	4.41
21	4.32	0.19	11.18	82.7%	20.85	9.57	308.2	27.2	98.8%	71.3%	70.4%	10.3	4.32
22	4.23	0.18	10.86	88.2%	20.85	9.90	306.0	27.1	98.8%	71.0%	70.2%	10.7	4.23
23	4.15	0.19	10.82	88.7%	20.85	9.94	305.5	27.2	98.8%	71.0%	70.1%	10.7	4.15
24	4.06	0.17	11.05	85.1%	20.85	9.71	305.4	27.1	98.9%	71.3%	70.6%	10.5	4.06
25	3.97	0.18	11.40	79.4%	20.85	9.36	307.6	27.1	98.9%	71.7%	70.9%	10.2	3.97
26	3.88	0.26	11.76	72.9%	20.84	8.96	310.9	26.9	98.3%	71.9%	70.7%	9.8	3.88
27	3.79	0.29	12.03	68.6%	20.84	8.67	314.4	27.1	98.2%	72.0%	70.7%	9.5	3.79
28	3.69	0.33	12.22	65.5%	20.84	8.45	317.9	27.0	97.9%	72.0%	70.5%	9.4	3.69
29	3.59	0.35	12.31	64.1%	20.84	8.35	320.1	27.1	97.8%	72.0%	70.4%	9.3	3.59
30	3.49	0.39	12.52	60.9%	20.84	8.12	323.1	26.8	97.6%	72.0%	70.3%	9.1	3.49
31	3.39	0.36	12.84	57.4%	20.83	7.82	325.8	26.8	97.8%	72.3%	70.7%	8.9	3.39
32	3.28	0.37	12.98	55.7%	20.83	7.67	328.1	27.0	97.8%	72.3%	70.7%	8.8	3.28
33	3.19	0.33	13.04	55.4%	20.83	7.63	330.0	26.8	98.0%	72.2%	70.8%	8.8	3.19
34	3.09	0.29	13.04	55.9%	20.83	7.65	330.8	26.9	98.3%	72.2%	71.0%	8.8	3.09
35	2.98	0.29	13.04	55.9%	20.83	7.65	331.9	26.8	98.3%	72.1%	70.9%	8.8	2.98

Stoichiometric Ratio (A/F)	
Weight (M <sub>g</sub> )	30.22
Weight Gas (N <sub>g</sub> )	359.68
Ratio (A/F)	10.36

%HC  
1.32

Combustion Efficiency: 98.37%  
 Total Input (kJ): 92,754 87,973 (Btu)  
 Total Output (kJ): 63,845 60,554 (Btu)  
 Efficiency: 68.83%  
 Total CO (g): 121.47

Moisture of Wood (wet basis): 17.4963  
 Initial Dry Weight W<sub>t,do</sub> (kg): 4.93  
 Moisture Content Dry 21.21

Load Weight (kg): **5.98**  
 Fuel Heating Value in kJ/kg - CV: **18,800** HHV **17,549** LHV  
 Btu/lb **8088.0** HHV

5181.2%	241.2%	5111.0%	92985	4.06	5.80	2.81	18800.00	17.50	79.03	20.96	2.92	8.42	0.02	0.29	39.96
% Wet Consumed	Dry Wt. Now W <sub>t,dn</sub>	% Dry Consumed	Total Input	Fuel Properties				Mw Moisture Fuel Burnt	Mass Balance (moles/100 mole dry flue gas)					kg Wood per 100 mole dfp	
				Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value		[h]	[u]	[w]	[j]	[k]	Nk	CO <sub>2</sub>
0.00	4.93	0.00	0	4.06	5.80	2.81	18800.00	17.50	79.04	20.96	1.23	3.57	-0.01	0.12	39.83
1.28	4.87	1.28	1954	4.06	5.80	2.81	18800.00	17.50	79.03	20.96	0.67	1.97	-0.01	0.07	39.58
2.93	4.79	2.93	1414	4.06	5.80	2.81	18800.00	17.50	79.05	20.97	0.83	2.45	-0.02	0.08	40.09
4.33	4.72	4.33	1126	4.06	5.80	2.81	18800.00	17.50	79.05	20.97	2.35	6.80	0.01	0.23	40.08
5.36	4.67	5.36	973	4.06	5.80	2.81	18800.00	17.50	79.05	20.97	2.03	5.90	0.00	0.20	40.06
6.43	4.62	6.43	1001	4.06	5.80	2.81	18800.00	17.50	79.07	20.97	2.06	5.98	0.00	0.20	40.32
7.52	4.56	7.52	1120	4.06	5.80	2.81	18800.00	17.50	79.08	20.98	2.15	6.24	0.00	0.21	40.36
8.84	4.50	8.84	1152	4.06	5.80	2.81	18800.00	17.50	79.07	20.97	2.28	6.60	0.00	0.23	40.28
10.00	4.44	10.00	1035	4.06	5.80	2.81	18800.00	17.50	79.07	20.97	2.04	5.92	0.00	0.20	40.25
11.08	4.39	11.08	1025	4.06	5.80	2.81	18800.00	17.50	79.05	20.97	1.97	5.71	0.00	0.20	40.09
12.21	4.33	12.21	1013	4.06	5.80	2.81	18800.00	17.50	79.05	20.97	2.00	5.80	0.00	0.20	40.11
13.26	4.28	13.26	1062	4.06	5.80	2.81	18800.00	17.50	79.05	20.97	2.04	5.91	0.00	0.20	40.06
14.50	4.22	14.50	1166	4.06	5.80	2.81	18800.00	17.50	79.05	20.97	2.22	6.44	0.00	0.22	40.09
15.77	4.16	15.77	1243	4.06	5.80	2.81	18800.00	17.50	79.06	20.97	2.38	6.89	0.00	0.24	40.16
17.18	4.09	17.18	1336	4.06	5.80	2.81	18800.00	17.50	79.07	20.97	2.51	7.26	0.00	0.25	40.23
18.65	4.01	18.65	1437	4.06	5.80	2.81	18800.00	17.50	79.07	20.97	2.68	7.76	0.01	0.27	40.23
20.28	3.93	20.28	1411	4.06	5.80	2.81	18800.00	17.50	79.06	20.97	2.88	8.32	0.01	0.29	40.16
21.70	3.86	21.70	1296	4.06	5.80	2.81	18800.00	17.50	79.07	20.97	2.85	8.24	0.01	0.28	40.24
23.07	3.80	23.07	1421	4.06	5.80	2.81	18800.00	17.50	79.05	20.97	2.89	8.35	0.01	0.29	40.07
24.76	3.71	24.76	1505	4.06	5.80	2.81	18800.00	17.50	78.96	20.94	2.95	8.46	0.04	0.29	39.34
26.32	3.64	26.32	1356	4.06	5.80	2.81	18800.00	17.50	78.99	20.95	3.04	8.76	0.03	0.30	39.64
27.69	3.57	27.69	1330	4.06	5.80	2.81	18800.00	17.50	79.05	20.97	2.81	8.11	0.01	0.28	40.09
29.19	3.49	29.19	1358	4.06	5.80	2.81	18800.00	17.50	79.06	20.97	2.72	7.88	0.01	0.27	40.13
30.61	3.42	30.61	1318	4.06	5.80	2.81	18800.00	17.50	79.05	20.97	2.72	7.85	0.01	0.27	40.09
32.03	3.35	32.03	1356	4.06	5.80	2.81	18800.00	17.50	79.06	20.97	2.77	8.01	0.01	0.28	40.17
33.54	3.28	33.54	1413	4.06	5.80	2.81	18800.00	17.50	79.06	20.97	2.86	8.26	0.01	0.28	40.15
35.08	3.20	35.08	1462	4.06	5.80	2.81	18800.00	17.50	79.03	20.96	2.97	8.56	0.02	0.29	39.88
36.69	3.12	36.69	1493	4.06	5.80	2.81	18800.00	17.50	79.01	20.96	3.04	8.77	0.03	0.30	39.79
38.30	3.04	38.30	1525	4.06	5.80	2.81	18800.00	17.50	78.99	20.95	3.10	8.93	0.03	0.31	39.64
39.98	2.96	39.98	1553	4.06	5.80	2.81	18800.00	17.50	78.98	20.95	3.13	9.00	0.04	0.31	39.58
41.65	2.88	41.65	1548	4.06	5.80	2.81	18800.00	17.50	78.97	20.95	3.19	9.17	0.04	0.32	39.48
43.32	2.80	43.32	1600	4.06	5.80	2.81	18800.00	17.50	78.99	20.95	3.26	9.38	0.04	0.32	39.61
45.10	2.71	45.10	1556	4.06	5.80	2.81	18800.00	17.50	78.98	20.95	3.30	9.49	0.04	0.33	39.60
46.67	2.63	46.67	1510	4.06	5.80	2.81	18800.00	17.50	79.00	20.96	3.30	9.51	0.03	0.33	39.72
48.35	2.55	48.35	1587	4.06	5.80	2.81	18800.00	17.50	79.02	20.96	3.29	9.49	0.03	0.33	39.87
50.09	2.46	50.09	1572	4.06	5.80	2.81	18800.00	17.50	79.02	20.96	3.29	9.49	0.03	0.33	39.87

Moisture Content  $M_{Cwb}$ : 17.4963

Dry kg : 4.93

CA: 49

HY: 6

OX: 44.9

LHV  
7549.9

40.04	0.81	0.05	304.75	29.07	11.78	595.48	12582.78	9108.08	8768.12	8689.59	12904.18	10464.24	300.09	36179.13	23809.08	
Moles per kg of Dry Wood						Moisture Present	Stack Temp K	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp K	CO <sub>2</sub>	O <sub>2</sub>
O <sub>2</sub>	CO	HC	N <sub>2</sub>	H <sub>2</sub> O	CO <sub>2</sub>			O <sub>2</sub>	CO	N <sub>2</sub>	CH <sub>4</sub>	H <sub>2</sub> O				
131.29	1.05	-0.05	649.08	29.28	11.78	528.59	9560.89	7022.20	6786.03	6719.75	9582.79	8107.06	298.38	380.82	921.94	
274.50	1.46	-0.21	1189.41	29.60	11.78	506.63	8574.15	6325.27	6119.55	6058.30	8532.91	7313.07	298.60	339.37	1736.29	
211.97	0.93	-0.19	954.50	29.56	11.78	524.08	9331.76	6859.16	6629.80	6564.77	9341.63	7920.84	299.09	374.10	1453.93	
48.90	0.72	0.02	338.50	29.13	11.78	538.74	9982.75	7315.73	7065.59	6997.45	10041.32	8439.73	299.30	400.11	357.74	
62.80	0.76	0.01	390.98	29.16	11.78	539.03	10005.23	7332.14	7081.43	7013.14	10064.07	8458.64	299.06	400.84	460.49	
61.43	0.53	-0.02	386.46	29.22	11.78	540.91	10091.30	7392.49	7139.02	7070.32	10156.62	8527.22	299.02	406.89	454.13	
57.11	0.49	-0.02	370.21	29.21	11.78	545.88	10298.36	7535.94	7275.47	7205.90	10383.04	8689.54	299.50	415.59	430.35	
51.70	0.55	0.00	349.60	29.18	11.78	550.06	10460.76	7647.32	7381.12	7310.93	10563.13	8815.10	300.22	421.34	395.39	
62.42	0.59	-0.01	390.00	29.20	11.78	547.51	10318.46	7546.10	7284.13	7214.72	10413.28	8699.51	300.90	415.31	471.00	
66.30	0.74	0.00	404.24	29.17	11.78	545.25	10215.89	7474.45	7215.82	7146.87	10302.40	8618.19	300.90	409.57	495.53	
64.45	0.72	0.00	397.33	29.17	11.78	543.48	10135.30	7418.10	7162.08	7093.51	10215.42	8554.21	300.91	406.51	478.13	
62.55	0.75	0.01	390.04	29.16	11.78	542.35	10064.21	7366.95	7112.92	7044.78	10141.82	8495.58	301.44	403.22	460.82	
53.98	0.72	0.02	357.72	29.14	11.78	544.69	10180.68	7449.13	7191.49	7122.76	10265.93	8589.17	301.16	408.17	402.09	
47.70	0.66	0.02	334.18	29.14	11.78	550.23	10438.88	7629.88	7363.92	7293.98	10544.19	8794.45	300.99	419.18	363.97	
43.22	0.59	0.01	317.43	29.15	11.78	558.64	10811.09	7888.26	7609.83	7538.28	10950.10	9087.03	301.29	434.90	340.95	
37.74	0.57	0.02	296.75	29.13	11.78	568.93	11282.04	8215.10	7920.88	7847.31	11463.87	9457.09	301.32	453.91	310.07	
32.46	0.63	0.04	276.60	29.10	11.78	577.10	11656.39	8473.92	8166.94	8091.82	11874.38	9749.75	301.39	468.14	275.03	
33.19	0.57	0.03	279.57	29.12	11.78	582.47	11936.13	8669.50	8353.45	8277.03	12176.41	9971.77	300.59	480.26	287.77	
32.14	0.71	0.05	275.18	29.08	11.78	584.24	12023.22	8729.96	8411.00	8334.21	12271.36	10040.24	300.46	481.73	280.62	
31.16	1.36	0.14	269.60	28.90	11.78	584.63	12049.55	8748.77	8429.04	8352.10	12298.92	10061.75	300.25	473.98	272.65	
28.72	1.08	0.10	261.16	28.97	11.78	584.15	12017.32	8725.74	8406.95	8330.19	12265.20	10035.41	300.51	476.37	250.63	
34.33	0.70	0.04	283.47	29.09	11.78	581.38	11894.69	8641.67	8327.22	8250.92	12129.16	9940.65	300.35	476.86	296.63	
36.59	0.66	0.03	292.15	29.11	11.78	579.16	11796.22	8574.05	8263.05	8187.14	12020.16	9864.37	300.23	473.41	313.76	
36.83	0.70	0.04	292.93	29.10	11.78	578.64	11766.47	8553.05	8242.98	8167.21	11988.47	9840.45	300.38	471.75	314.97	
35.32	0.63	0.03	287.43	29.11	11.78	578.53	11766.42	8553.43	8243.45	8167.66	11987.50	9841.06	300.25	472.67	302.08	
32.95	0.64	0.04	278.45	29.10	11.78	580.79	11872.75	8626.96	8313.35	8237.12	12104.10	9924.19	300.21	476.69	284.29	
30.37	0.87	0.07	268.02	29.03	11.78	584.07	12031.62	8737.08	8418.12	8341.21	12277.70	10048.83	300.03	479.87	265.38	
28.67	0.96	0.09	261.32	29.00	11.78	587.55	12186.36	8843.08	8518.62	8441.14	12449.56	10168.28	300.23	484.85	253.49	
27.42	1.08	0.10	256.26	28.97	11.78	591.05	12353.12	8958.11	8627.91	8549.76	12632.99	10298.25	300.13	489.72	245.67	
26.86	1.13	0.11	253.98	28.95	11.78	593.21	12447.60	9022.55	8688.94	8610.45	12738.55	10370.75	300.29	492.72	242.35	
25.61	1.22	0.13	249.00	28.92	11.78	596.21	12599.67	9127.97	8789.22	8710.09	12904.71	10490.06	299.99	497.41	233.81	
24.11	1.10	0.11	243.67	28.95	11.78	598.93	12727.35	9215.61	8872.38	8792.76	13046.12	10588.91	299.98	504.14	222.21	
23.40	1.11	0.12	240.96	28.94	11.78	601.24	12828.35	9284.22	8937.27	8857.32	13159.55	10665.98	300.18	507.99	217.28	
23.24	1.01	0.10	240.65	28.97	11.78	603.12	12924.42	9350.70	9000.49	8920.13	13264.77	10741.18	299.98	513.38	217.29	
23.39	0.88	0.08	241.60	29.01	11.78	603.94	12961.70	9376.11	9024.55	8944.07	13306.45	10769.77	300.01	516.75	219.31	
23.39	0.87	0.08	241.62	29.01	11.78	605.05	13016.75	9414.04	9060.57	8979.87	13367.11	10812.60	299.94	518.99	220.23	

SUMS					AVERAGE	SUMS						
17106.16	181882.30	3270.04	113937.28	46174.30	5866.09	28900.16	1501.97	27398.20	64085.33	1510.71	121.47	4.93
Energy Losses (kJ/kg of Dry Fuel)					Total Loss Rate	Total Loss	Chemical Loss 1	Sensible and Latent Loss	Total Output	Chem Loss 2	Grams Produced	
Flue Gas Constituent											CO	HC
CO	N <sub>2</sub>	CH <sub>4</sub>	H <sub>2</sub> O Comb	H <sub>2</sub> O Fuel MC								
304.55	4361.67	-48.30	1524.91	613.54	8059.13	0.00	0	0.00	0	0	0.00	0.00
422.05	7205.82	-190.35	1517.88	604.18	11635.24	1209.52	23	1186.17	745	23	4.25	-0.35
269.28	6266.10	-171.09	1533.63	611.34	10337.29	777.41	7	770.36	636	7	1.96	-0.23
209.90	2368.64	22.34	1526.43	617.46	5502.61	329.69	14	316.10	797	14	1.21	0.02
219.51	2742.00	7.72	1528.68	617.68	5976.92	309.28	11	297.80	664	11	1.10	0.01
153.14	2732.37	-18.24	1533.71	618.49	5880.48	313.10	7	306.11	688	7	0.79	-0.02
142.69	2667.67	-16.86	1538.29	620.40	5798.14	345.31	7	338.01	774	7	0.82	-0.02
160.48	2555.88	-2.19	1540.24	621.88	5693.01	348.81	9	339.36	803	9	0.95	0.00
171.82	2813.71	-11.79	1537.98	620.52	6018.56	331.40	9	322.82	704	9	0.91	-0.01
213.70	2889.09	0.56	1534.17	619.56	6162.18	336.03	11	324.63	689	11	1.12	0.00
208.55	2818.48	0.89	1532.26	618.81	6063.63	326.69	11	315.68	686	11	1.08	0.00
219.00	2747.71	7.84	1529.74	618.12	5986.45	338.14	13	325.63	724	13	1.19	0.01
208.78	2547.93	15.03	1531.63	619.22	5732.85	355.46	14	341.91	810	14	1.25	0.02
190.23	2437.48	15.64	1537.54	621.64	5585.69	369.24	13	355.96	874	13	1.21	0.02
170.34	2392.91	13.26	1546.35	625.08	5523.80	392.58	13	379.86	944	13	1.17	0.02
167.05	2328.72	19.17	1556.44	629.44	5464.81	417.77	14	403.90	1019	14	1.23	0.03
183.35	2238.16	33.04	1563.31	632.89	5393.93	404.89	16	389.07	1006	16	1.32	0.04
164.82	2314.01	24.27	1570.82	635.51	5477.46	377.49	13	364.81	918	13	1.09	0.03
207.95	2293.37	43.69	1570.49	636.31	5514.16	416.92	19	398.39	1005	19	1.51	0.06
395.05	2251.76	123.18	1561.60	636.57	5714.79	457.34	40	416.92	1047	40	3.04	0.17
316.00	2175.54	93.43	1564.40	636.26	5512.63	397.71	29	368.92	959	29	2.19	0.12
202.66	2338.93	38.57	1568.21	635.14	5556.99	393.16	17	376.54	937	17	1.38	0.05
192.66	2391.89	31.35	1566.85	634.24	5604.16	404.70	16	388.95	953	16	1.34	0.04
202.88	2392.39	35.32	1565.68	633.96	5616.95	393.90	16	377.63	924	16	1.37	0.04
182.11	2347.61	28.66	1566.49	633.97	5533.59	399.04	15	384.24	957	15	1.26	0.04
186.72	2293.60	33.75	1568.30	634.95	5478.31	411.86	16	395.72	1002	16	1.35	0.04
254.00	2235.63	65.31	1568.15	636.42	5504.76	428.21	24	404.01	1034	24	1.90	0.09
278.63	2205.82	77.87	1570.12	637.82	5508.59	437.48	28	409.90	1056	28	2.13	0.11
315.04	2190.99	94.72	1571.86	639.35	5547.35	450.10	32	417.72	1075	32	2.45	0.14
330.15	2186.89	101.77	1573.12	640.21	5567.21	459.96	35	425.20	1093	35	2.62	0.15
356.98	2168.84	114.62	1575.02	641.61	5588.29	460.10	38	422.29	1088	38	2.82	0.17
322.34	2142.52	102.15	1579.39	642.78	5515.52	469.44	35	434.27	1131	35	2.63	0.15
325.08	2134.29	104.23	1581.37	643.69	5513.93	456.32	35	421.74	1100	35	2.58	0.15
293.52	2146.64	91.27	1585.12	644.57	5491.80	441.14	30	411.07	1069	30	2.26	0.13
256.23	2160.85	75.49	1587.86	644.91	5461.39	461.01	27	433.77	1126	27	2.07	0.11
255.39	2169.70	75.13	1589.15	645.41	5473.99	457.84	27	430.96	1115	27	2.05	0.11

## Sample Calculations – ASTM E3053 & E2515

Client: SBI  
 Model: 1.7R  
 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.

$M_{Fdb}$  – 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<sub>Fldb</sub> – Weight of test fuel load, dry basis, lb (kg)**

ASTM E3053 equation (1)

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

Where,

- M<sub>FLnwb</sub> = Weight of each test fuel piece, n, in test fuel load per 8.4.1, wet basis, lb (kg)
- MC<sub>FLn</sub> = 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 <sub>FLnwb</sub>	MC <sub>FLn</sub>	(M <sub>FLnwb</sub> )(100/(100 + MC <sub>FLn</sub> ))	
1	3.39	22.9	3.394 (100) / ( 100+ 22.9 )) =	2.76
2	4.07	21.8	4.069 (100) / ( 100+ 21.8 )) =	3.34
3	3.52	20.2	3.522 (100) / ( 100+ 20.2 )) =	2.93
4	4.05	21.2	4.048 (100) / ( 100+ 21.2 )) =	3.34
5	2.49	21.6	2.485 (100) / ( 100+ 21.6 )) =	2.04
6	0.00	NA	N/A	-
7			N/A	-
			SUM	14.42 lbs
M <sub>Fldb</sub> =	<b>14.42</b>	lbs		
M <sub>Fldb</sub> =	<b>6.54</b>	kg		

**M<sub>SUdb</sub> – Weight of start-up fuel, dry basis, lb (kg)**

ASTM E3053 equation (2)

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

Where,

M<sub>SUwb</sub> = Total weight of start-up fuel pieces, wet basis, lb (kg)

MC<sub>SU</sub> = Average fuel moisture of the piece(s) from which start-up fuel was split, % dry basis

Sample Calculation:

M<sub>SUwb</sub> = N/A - Applicable to High Fire Tests Only

MC<sub>SU</sub> = N/A - Applicable to High Fire Tests Only

M<sub>SUdb</sub> = N/A (100 / (100 + N/A )

M<sub>SUdb</sub> = **N/A** lbs

= **N/A** kg



**M<sub>Kdb</sub> - Weight of kindling, dry basis, lb (kg)**

ASTM E3053 equation (3)

$$M_{Kdb} = (M_{Kwb}) \left( \frac{100}{100 + MC_K} \right)$$

Where,

M<sub>Kwb</sub> = Weight of kindling per 8.5.6, wet basis, lb (kg);

MC<sub>K</sub> = Average moisture of kindling (may be assumed 10%), % dry basis.

Sample calculation:

M<sub>Kwb</sub> = N/A - Applicable to High Fire Tests Only

MC<sub>K</sub> = N/A - Applicable to High Fire Tests Only

$$M_{Kdb} = N/A \left( \frac{100}{100 + N/A} \right)$$

M<sub>Kdb</sub> = **N/A** lbs

= **N/A** kgs

**M<sub>FREHdb</sub> - 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<sub>RSUBdb</sub> = Weight of residual start-up fuel bed when high fire test load added, lb (kg)

M<sub>FLEHdb</sub> = Weight of unburned portion of test fuel load at the end of the high fire test run, lb (kg)

Sample calculation:

M<sub>RSUBdb</sub> = N/A - Applicable to High Fire Tests Only

M<sub>FLEHdb</sub> = N/A - Applicable to High Fire Tests Only

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

$$M_{FREHdb} = \mathbf{N/A} \text{ lbs}$$

$$= \mathbf{N/A} \text{ kg}$$

**M<sub>TFBHdb</sub> - 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:

$$M_{Kdb} = N/A$$

$$M_{SUDb} = N/A$$

$$M_{FLdb} = N/A$$

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

$$M_{TFBHdb} = N/A + N/A + N/A - N/A$$

$$= \mathbf{N/A} \text{ lbs}$$

$$= \mathbf{N/A} \text{ kg}$$

**BR<sub>H</sub>** – 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,

$\theta_{H1}$  = 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

$\theta_{H1}$  = N/A - Applicable to High Fire Tests Only

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

$BR_H$  = **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:

$$M_{FLdb} = 14.42$$

$$M_{FREdb} = 0.00$$

$$M_{TFBdb} = 14.42 - 0.00$$

$$= \mathbf{14.42} \text{ lbs}$$

$$= \mathbf{6.54} \text{ kg}$$

**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,

$\theta$  = Total test run duration for low or medium fire test run, min.

Sample Calculation:

$$M_{TFBdb} = 14.42$$

$$\theta = 508$$

$$BR = \frac{60 \times 14.42}{508}$$

$$BR = 1.70 \text{ lb/hr}$$

$$= 0.77 \text{ kg/hr}$$

**$V_s$  – 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
- $\Delta P^*$  = 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.  $H_2O$ ; (in Hg = in  $H_2O/13.6$ )
- $M_s$  = \*\*The dilution tunnel wet molecular weight;  $M_s = 28.78$  assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$F_p = \frac{18.28}{19.72} = 0.927$$

$$V_s = 0.927 \times 85.49 \times 0.99 \times 0.295 \times \left( \left( \frac{89.9 + 460}{29.43 + \frac{-0.18}{13.6}} \right) \times 28.78 \right)^{1/2}$$

$$V_s = \mathbf{18.67} \text{ ft/s}$$

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

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

**Q<sub>sd</sub> – 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<sub>ws</sub> = Water vapor in gas stream, proportion by volume; assume 2%
- A = Cross sectional area of dilution tunnel, ft<sup>2</sup>
- T<sub>std</sub> = Standard absolute temperature, 528 °R
- P<sub>s</sub> = Absolute average gas static pressure in dilution tunnel, = P<sub>bar</sub> + P<sub>g</sub>, in Hg
- T<sub>s(avg)</sub> = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
- P<sub>std</sub> = Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 18.67 \times 0.3491 \times \frac{528}{89.9 + 460} \times \frac{29.43 + \frac{-0.18}{13.6}}{29.92}$$

Q<sub>sd</sub> = **21696.9** 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
- $\Delta H$  = Average pressure differential across the orifice meter, in. H<sub>2</sub>O
- $T_m$  = Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train A:

$$V_{m(std)} = 17.64 \times 95.808 \times 1.023 \times \frac{(29.43 + \frac{0.57}{13.6})}{(78.4 + 460)}$$

$$V_{m(std)} = \mathbf{94.618} \text{ dscf}$$

Using equation for Train B:

$$V_{m(std)} = 17.64 \times 93.844 \times 1.019 \times \frac{(29.43 + \frac{0.45}{13.6})}{(77.1 + 460)}$$

$$V_{m(std)} = \mathbf{92.527} \text{ dscf}$$

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 92.39 \times 1.01 \times \frac{(29.43 + \frac{0.00}{13.6})}{(83.1 + 460)}$$

$$V_{m(std)} = \mathbf{89.177} \text{ dscf}$$



**$m_n$  – Total Particulate Matter Collected, mg**

ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

$m_p$  = mass of particulate matter from probe, mg

$m_f$  = mass of particulate matter from filters, mg

$m_g$  = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A:

$$m_n = 0.1 + 7.6 + 0.6$$

$$m_n = 8.3 \text{ mg}$$

Using equation for Train B:

$$m_n = 0.1 + 7.5 + 0.7$$

$$m_n = 8.3 \text{ mg}$$

**C<sub>s</sub> - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf**  
 ASTM E2515 equation (13)

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

Where:

- K<sub>2</sub> = Constant, 0.001 g/mg  
 m<sub>n</sub> = Total mass of particulate matter collected in the sampling train, mg  
 V<sub>m(std)</sub> = Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train A:

$$C_s = 0.001 \times \frac{8.3}{94.62}$$

$$C_s = \mathbf{0.00009} \text{ g/dscf}$$

For Train B

$$C_s = 0.001 \times \frac{8.3}{92.53}$$

$$C_s = \mathbf{0.00009} \text{ g/dscf}$$

For Ambient Train

$$C_r = 0.001 \times \frac{0.1}{89.18}$$

$$C_r = \mathbf{0.000001} \text{ g/dscf}$$

**E<sub>T</sub> – Total Particulate Emissions, g**

ASTM E2515 equation (15)

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

Where:

- C<sub>s</sub> = Concentration of particulate matter in tunnel gas, g/dscf
- C<sub>r</sub> = Concentration particulate matter room air, g/dscf
- Q<sub>std</sub> = Average dilution tunnel gas flow rate, dscf/hr
- θ = Total time of test run, minutes

Sample calculation:

For Train A

$$E_T = ( 0.000088 - 0.000001 ) \times 21696.9 \times 508 /60$$

$$E_T = \mathbf{15.91} \text{ g}$$

For Train B

$$E_T = ( 0.000090 - 0.000001 ) \times 21696.9 \times 508 /60$$

$$E_T = \mathbf{16.27} \text{ g}$$

Average

$$E = \mathbf{16.09} \text{ g}$$

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

$$7.5\% \text{ of the average} = 1.21$$

$$\text{Train A difference} = 0.18$$

$$\text{Train B difference} = 0.18$$

**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:

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

Sample calculation (for the first 10 minute interval of Train A):

$$PR = \left( \frac{508 \times 1.826 \times 18.67 \times (128.5 + 460) \times (78.4 + 460)}{10 \times 95.808 \times 18.43 \times (89.9 + 460) \times (78.0 + 460)} \right) \times 100$$

PR = **105** %

**PM<sub>RH</sub> - 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

$\theta_{H2}$  = 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

$\theta_{H2}$  = N/A - Applicable to High Fire Tests Only

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

$$PM_{RH} = \mathbf{N/A} \text{ g/hr}$$

**PM<sub>FH</sub> - 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

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

$$= \mathbf{N/A} \text{ g/kg}$$

**PM<sub>R</sub> - Particulate emission rate for low or medium fire test runs, g/hr**

ASTM E3053 equation (12)

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

Where,

E<sub>T</sub> = Total particulate emissions for low or medium fire test runs from Test Method E2515, g

Sample Calculation:

$$E_T = 16.09$$

$$\theta = 508$$

$$PM_R = 60( 16.09 / 508 )$$

$$PM_{RH} = 1.90 \text{ g/hr}$$

**PM<sub>FH</sub> - 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:

$$E_T = 16.09$$

$$M_{TFBdb} = 6.54$$

$$PM_{FH} = 16.09 / 6.54$$

$$= 2.46 \text{ g/kg}$$

**Stack Loss Efficiency and CO emissions calculations are done in accordance with CSA B415.1, using the password protected excel spreadsheet provided with the test standard. No alterations or alternative calculations are used for determining efficiency or CO emissions. The following pages are a sample of the calculations page from the B415.1 Spreadsheet (V2\_4 - Dated April 15, 2010).**

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 06/06/23  
**Run:** 2  
**Control #:** 23-161  
**Test Duration:** 508 min

	HHV	LHV
Eff	71.41%	76.50%
Comb Eff	94.70%	94.70%
HT Eff	75.40%	80.77%
Output	10,369	kJ/h
Burn Rate	0.77	kg/h
Grams CO	496	g
Input	14,521	kJ/h
MC wet	17.71	
Averages	0.54	5.48

Note: In the "Input data", "Calc. % O<sub>2</sub>", "Fuel Properties", and "Mass Balance" columns, [e], [d], [g], [a], [b], [c], [h], [u], [w], [j], and [k] refer to their respective variables in Clauses 13.7.3 to 13.7.5.

Overall Heating Efficiency: 71.41%  
 Combustion Efficiency: 94.70%  
 Heat Transfer Efficiency: 75.40%

Heat Output: 9,836 Btu/h  
 Heat Input: 13,775 Btu/h

Burn Duration: 8.47 h

Burn Rate: 1.70 lb/h 0.772 kg/h

Stack Temp: 247.4 Deg. F 119.7 Deg. C

Ultimate CO<sub>2</sub>  
 CO<sub>2-ult</sub> 20.77  
 F<sub>0</sub>  
 1.001

INPUT DATA				Oxygen Calculation			Input Data		Combust Eff %	Heat Transfer %	Net Eff %	Air Fuel Ratio	Wet Wt Now Wt
Elapsed Time	Weight Remaining (kg)	% CO [e]	% CO <sub>2</sub> [d]	Excess Air EA	Total O <sub>2</sub>	Calc. % O <sub>2</sub> [g]	Flue Gas (°C)	Room Temp (°C)					
0	7.95	0.07	4.20	386.9%	20.91	16.67	269.4	27.1	99.7%	51.2%	51.1%	27.7	7.95
1	7.89	0.11	2.34	746.9%	20.92	18.52	242.8	26.7	98.1%	30.2%	29.7%	48.2	7.89
2	7.76	0.48	3.73	393.9%	20.91	16.94	263.4	28.0	91.3%	48.2%	44.1%	27.7	7.76
3	7.60	0.42	5.43	254.9%	20.89	15.25	336.8	29.4	94.5%	50.9%	48.1%	20.0	7.60
4	7.43	1.79	12.97	40.7%	20.82	6.96	337.2	29.9	89.7%	71.4%	64.1%	7.8	7.43
5	7.33	1.47	13.37	40.0%	20.82	6.72	331.1	29.2	91.6%	72.3%	66.2%	7.8	7.33
6	7.22	1.10	12.95	47.9%	20.83	7.33	325.2	29.5	93.4%	72.3%	67.5%	8.3	7.22
7	7.12	0.99	13.10	47.5%	20.83	7.23	317.7	29.8	94.1%	73.0%	68.7%	8.2	7.12
8	7.04	0.65	12.26	61.0%	20.84	8.25	310.3	29.8	95.8%	72.6%	69.6%	9.0	7.04
9	6.96	0.54	11.87	67.4%	20.84	8.70	305.8	28.9	96.4%	72.4%	69.8%	9.4	6.96
10	6.87	0.50	11.91	67.4%	20.84	8.68	302.1	29.3	96.7%	72.7%	70.3%	9.4	6.87
11	6.79	0.80	12.32	58.4%	20.84	8.12	296.1	29.6	94.9%	73.5%	69.8%	8.9	6.79
12	6.74	0.62	11.55	70.8%	20.84	8.99	285.6	30.3	95.8%	73.4%	70.3%	9.6	6.74
13	6.67	0.59	12.72	56.1%	20.83	7.82	272.9	30.5	96.3%	75.5%	72.7%	8.8	6.67
14	6.61	0.40	11.85	69.5%	20.84	8.79	262.5	30.5	97.3%	75.4%	73.4%	9.6	6.61
15	6.56	0.35	10.41	93.1%	20.85	10.27	252.0	30.0	97.4%	74.4%	72.5%	10.9	6.56
16	6.53	0.31	8.82	127.4%	20.87	11.89	241.6	29.7	97.4%	72.8%	70.9%	12.8	6.53
17	6.49	0.38	8.07	145.9%	20.87	12.61	233.3	29.6	96.5%	72.1%	69.6%	13.9	6.49
18	6.45	0.48	7.86	149.2%	20.87	12.78	226.7	29.7	95.5%	72.3%	69.0%	14.0	6.45
19	6.42	0.48	7.81	150.5%	20.87	12.82	221.3	30.4	95.4%	72.7%	69.4%	14.1	6.42
20	6.37	0.52	7.80	149.7%	20.87	12.81	217.0	30.6	95.0%	73.1%	69.5%	14.0	6.37
21	6.33	0.54	7.96	144.6%	20.87	12.64	213.9	30.7	94.9%	73.7%	70.0%	13.7	6.33
22	6.28	0.56	8.05	141.3%	20.87	12.54	211.2	30.6	94.8%	74.1%	70.2%	13.6	6.28
23	6.23	0.47	8.67	127.4%	20.87	11.96	209.1	30.5	95.9%	75.3%	72.3%	12.8	6.23
24	6.19	0.46	8.84	123.3%	20.87	11.79	206.5	30.3	96.0%	75.8%	72.8%	12.6	6.19
25	6.14	0.54	8.81	122.1%	20.87	11.78	204.3	30.6	95.3%	75.9%	72.4%	12.5	6.14
26	6.09	0.58	9.18	112.8%	20.86	11.39	203.7	31.0	95.1%	76.5%	72.8%	12.0	6.09
27	6.04	0.68	9.21	110.2%	20.86	11.31	203.5	30.8	94.4%	76.5%	72.2%	11.8	6.04
28	5.98	0.69	9.51	103.6%	20.86	11.00	203.9	31.2	94.4%	76.9%	72.6%	11.4	5.98
29	5.93	0.61	10.21	91.9%	20.85	10.34	207.1	30.9	95.3%	77.4%	73.8%	10.8	5.93
30	5.89	0.59	9.89	98.3%	20.86	10.67	209.6	30.2	95.4%	76.8%	73.3%	11.1	5.89
31	5.85	0.54	10.09	95.5%	20.86	10.50	211.9	30.0	95.9%	76.9%	73.7%	11.0	5.85
32	5.80	0.55	10.21	93.1%	20.85	10.37	212.8	30.1	95.8%	77.0%	73.7%	10.9	5.80
33	5.76	0.50	10.47	89.4%	20.85	10.13	214.3	29.7	96.3%	77.1%	74.3%	10.7	5.76
34	5.71	0.50	10.48	89.2%	20.85	10.12	215.6	30.1	96.3%	77.1%	74.2%	10.7	5.71
35	5.66	0.46	10.82	84.2%	20.85	9.80	216.7	29.4	96.7%	77.3%	74.8%	10.4	5.66



Ratio (A/F)	
Weight (M <sub>g</sub> )	29.48
Gas (N <sub>2</sub> )	706.22
Ratio (A/F)	20.31

%HC  
1.32

Combustion Efficiency: 94.70%  
 Total Input (kJ): 122,946 116,609 (Btu)  
 Total Output (kJ): 87,792 83,267 (Btu)  
 Efficiency: 71.41%  
 Total CO (g): 496.20

Moisture of Wood (wet basis): 17.7109  
 Initial Dry Weight W<sub>t,do</sub> (kg): 6.54  
 Moisture Content Dry 21.52

Load Weight (kg): 7.95  
 Fuel Heating Value in kJ/kg - CV: 18,800  
 HHV 17,549  
 LHV  
 Btu/lb 8088.0

7917.6%	147.6%	7742.7%	122956	4.06	5.80	2.81	18800.00	17.71	78.84	20.91	1.50	4.24	0.05	0.15	36.19
% Wet Consumed	Dry Wt. Now W <sub>t,dn</sub>	% Dry Consumed y	Total Input	Fuel Properties				Mw Moisture Fuel Burnt	Mass Balance (moles/100 mole dry flue gas)					kg Wood per 100 mole dfp	
				Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value		[h]	[u]	[w]	[j]	[k]	Nk	CO <sub>2</sub>
0.00	6.54	0.00	0	4.06	5.80	2.81	18800.00	17.71	79.06	20.97	1.05	3.07	-0.02	0.10	40.34
0.67	6.50	0.67	1887	4.06	5.80	2.81	18800.00	17.71	79.02	20.96	0.60	1.77	-0.01	0.06	39.14
2.40	6.38	2.40	2309	4.06	5.80	2.81	18800.00	17.71	78.86	20.92	1.05	2.96	0.04	0.10	35.88
4.43	6.25	4.43	2493	4.06	5.80	2.81	18800.00	17.71	78.90	20.93	1.45	4.14	0.03	0.14	37.66
6.45	6.12	6.45	2075	4.06	5.80	2.81	18800.00	17.71	78.28	20.76	3.69	10.25	0.23	0.37	35.32
7.81	6.03	7.81	1660	4.06	5.80	2.81	18800.00	17.71	78.44	20.81	3.70	10.36	0.19	0.37	36.32
9.15	5.94	9.15	1577	4.06	5.80	2.81	18800.00	17.71	78.62	20.85	3.50	9.86	0.14	0.35	37.27
10.37	5.86	10.37	1403	4.06	5.80	2.81	18800.00	17.71	78.68	20.87	3.50	9.91	0.12	0.35	37.64
11.44	5.79	11.44	1264	4.06	5.80	2.81	18800.00	17.71	78.84	20.91	3.20	9.13	0.08	0.32	38.56
12.43	5.73	12.43	1282	4.06	5.80	2.81	18800.00	17.71	78.89	20.93	3.07	8.79	0.06	0.31	38.86
13.52	5.66	13.52	1297	4.06	5.80	2.81	18800.00	17.71	78.91	20.93	3.07	8.80	0.05	0.31	39.00
14.54	5.59	14.54	988	4.06	5.80	2.81	18800.00	17.71	78.77	20.89	3.26	9.25	0.10	0.32	38.07
15.13	5.55	15.13	924	4.06	5.80	2.81	18800.00	17.71	78.85	20.91	3.01	8.60	0.07	0.30	38.54
16.04	5.49	16.04	1022	4.06	5.80	2.81	18800.00	17.71	78.87	20.92	3.30	9.42	0.07	0.33	38.83
16.79	5.44	16.79	846	4.06	5.80	2.81	18800.00	17.71	78.96	20.94	3.03	8.70	0.04	0.30	39.35
17.42	5.40	17.42	672	4.06	5.80	2.81	18800.00	17.71	78.97	20.95	2.66	7.65	0.03	0.26	39.39
17.88	5.37	17.88	582	4.06	5.80	2.81	18800.00	17.71	78.98	20.95	2.26	6.50	0.02	0.22	39.32
18.36	5.34	18.36	571	4.06	5.80	2.81	18800.00	17.71	78.94	20.94	2.09	6.00	0.03	0.21	38.84
18.81	5.31	18.81	550	4.06	5.80	2.81	18800.00	17.71	78.89	20.93	2.07	5.90	0.05	0.21	38.28
19.26	5.28	19.26	604	4.06	5.80	2.81	18800.00	17.71	78.88	20.92	2.06	5.87	0.05	0.20	38.23
19.80	5.25	19.80	708	4.06	5.80	2.81	18800.00	17.71	78.87	20.92	2.06	5.88	0.05	0.21	38.04
20.41	5.21	20.41	747	4.06	5.80	2.81	18800.00	17.71	78.86	20.92	2.11	6.00	0.05	0.21	38.02
21.01	5.17	21.01	712	4.06	5.80	2.81	18800.00	17.71	78.85	20.91	2.14	6.08	0.06	0.21	37.93
21.57	5.13	21.57	692	4.06	5.80	2.81	18800.00	17.71	78.90	20.93	2.26	6.47	0.04	0.22	38.56
22.14	5.09	22.14	720	4.06	5.80	2.81	18800.00	17.71	78.90	20.93	2.30	6.59	0.04	0.23	38.61
22.74	5.05	22.74	755	4.06	5.80	2.81	18800.00	17.71	78.86	20.92	2.32	6.61	0.06	0.23	38.23
23.37	5.01	23.37	812	4.06	5.80	2.81	18800.00	17.71	78.85	20.91	2.42	6.90	0.06	0.24	38.14
24.06	4.97	24.06	819	4.06	5.80	2.81	18800.00	17.71	78.80	20.90	2.45	6.97	0.07	0.24	37.76
24.70	4.92	24.70	816	4.06	5.80	2.81	18800.00	17.71	78.79	20.90	2.53	7.19	0.08	0.25	37.77
25.39	4.88	25.39	729	4.06	5.80	2.81	18800.00	17.71	78.84	20.91	2.68	7.65	0.07	0.27	38.28
25.88	4.85	25.88	640	4.06	5.80	2.81	18800.00	17.71	78.85	20.91	2.60	7.41	0.06	0.26	38.31
26.43	4.81	26.43	675	4.06	5.80	2.81	18800.00	17.71	78.88	20.92	2.63	7.52	0.06	0.26	38.56
26.98	4.78	26.98	706	4.06	5.80	2.81	18800.00	17.71	78.87	20.92	2.67	7.61	0.06	0.27	38.53
27.58	4.74	27.58	749	4.06	5.80	2.81	18800.00	17.71	78.90	20.93	2.72	7.77	0.05	0.27	38.79
28.20	4.70	28.20	777	4.06	5.80	2.81	18800.00	17.71	78.90	20.93	2.72	7.78	0.05	0.27	38.78
28.84	4.65	28.84	746	4.06	5.80	2.81	18800.00	17.71	78.92	20.93	2.79	8.00	0.05	0.28	39.01

Moisture Content  $M_{Cwb}$ : 17.71094

Dry kg : 6.54  
 CA: 49  
 HY: 6  
 OX: 44.9

LHV  
 7549.9

125.47	4.26	0.39	617.77	28.40	11.96	393.10	3680.37	2754.53	2674.84	2645.98	3576.23	3199.68	301.56	69877.82	130230.96	
Moles per kg of Dry Wood						Moisture Present	Stack Temp K	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp K	CO <sub>2</sub>	O <sub>2</sub>
O <sub>2</sub>	CO	HC	N <sub>2</sub>	H <sub>2</sub> O	CO <sub>2</sub>			O <sub>2</sub>	CO	N <sub>2</sub>	CH <sub>4</sub>	H <sub>2</sub> O				
160.12	0.64	-0.15	759.29	29.48	11.96	542.57	10119.32	7408.70	7153.59	7084.98	10194.26	8544.27	300.26	408.18	1186.30	
309.88	1.89	-0.21	1321.93	29.59	11.96	515.96	8940.42	6581.31	6363.72	6300.77	8928.40	7603.73	299.85	349.97	2039.39	
162.91	4.58	0.38	758.43	28.42	11.96	536.55	9813.54	7192.25	6946.46	6879.44	9869.98	8297.47	301.14	352.06	1171.72	
105.77	2.93	0.24	547.13	28.70	11.96	609.99	13149.44	9496.10	9135.99	9055.37	13533.84	10901.46	302.56	495.16	1004.41	
18.95	4.88	0.63	213.18	27.92	11.96	610.37	13149.39	9494.48	9134.03	9053.52	13537.24	10898.99	303.03	464.45	179.88	
18.25	3.99	0.51	213.11	28.15	11.96	604.29	12887.83	9317.79	8967.17	8887.46	13241.32	10700.88	302.37	468.13	170.03	
21.09	3.17	0.40	226.26	28.38	11.96	598.36	12598.61	9118.68	8778.11	8699.54	12922.27	10476.10	302.65	469.51	192.30	
20.79	2.83	0.35	226.09	28.47	11.96	590.80	12232.71	8866.31	8538.35	8461.25	12519.68	10190.98	302.97	460.48	184.33	
25.96	2.03	0.24	247.95	28.70	11.96	583.46	11890.49	8630.62	8314.53	8238.78	12142.38	9924.85	302.99	458.47	224.04	
28.49	1.77	0.20	258.29	28.78	11.96	578.96	11716.42	8513.32	8203.83	8128.61	11944.82	9793.45	302.07	455.35	242.54	
28.42	1.65	0.18	258.39	28.82	11.96	575.27	11532.69	8385.33	8081.90	8007.49	11745.44	9648.34	302.41	449.79	238.34	
25.09	2.46	0.29	243.42	28.59	11.96	569.28	11242.69	8183.54	7889.72	7816.59	11430.23	9419.65	302.77	428.05	205.30	
29.98	2.06	0.23	263.10	28.71	11.96	558.76	10734.26	7828.68	7551.46	7480.65	10880.00	9017.04	303.44	413.70	234.72	
23.87	1.79	0.21	240.77	28.76	11.96	546.04	10147.73	7419.39	7161.35	7093.21	10245.04	8552.72	303.62	394.04	177.13	
29.19	1.34	0.14	262.21	28.90	11.96	535.66	9676.75	7089.67	6846.80	6780.86	9737.51	8178.23	303.66	380.81	206.98	
38.86	1.32	0.12	298.80	28.93	11.96	525.14	9224.54	6773.39	6545.15	6481.32	9249.53	7819.15	303.13	363.33	263.20	
53.01	1.40	0.11	352.06	28.96	11.96	514.72	8769.43	6453.11	6239.16	6177.57	8762.76	7454.71	302.87	344.80	342.05	
60.71	1.83	0.16	379.94	28.86	11.96	506.45	8405.99	6196.17	5993.38	5933.66	8376.60	7161.89	302.79	326.51	376.16	
62.22	2.32	0.22	384.24	28.73	11.96	499.85	8111.46	5987.02	5793.07	5734.93	8065.69	6923.17	302.87	310.54	372.54	
62.77	2.37	0.23	386.17	28.72	11.96	494.49	7849.16	5798.94	5612.47	5555.84	7792.77	6707.77	303.56	300.09	363.99	
62.49	2.54	0.25	384.60	28.68	11.96	490.14	7650.45	5656.92	5476.21	5420.71	7585.00	6545.31	303.78	291.01	353.48	
60.39	2.56	0.25	376.65	28.67	11.96	487.04	7510.73	5557.01	5380.34	5325.63	7439.03	6431.00	303.89	285.54	335.61	
59.10	2.63	0.27	371.54	28.64	11.96	484.38	7399.33	5477.72	5304.36	5250.26	7321.83	6340.43	303.76	280.67	323.74	
53.21	2.07	0.20	350.91	28.78	11.96	482.26	7312.78	5416.18	5245.40	5191.76	7230.65	6270.15	303.61	281.98	288.22	
51.51	2.02	0.20	344.62	28.78	11.96	479.67	7205.48	5339.70	5172.08	5119.04	7118.00	6182.75	303.48	278.20	275.07	
51.14	2.36	0.24	342.22	28.69	11.96	477.44	7096.50	5261.02	5096.39	5044.01	7005.78	6092.42	303.79	271.30	269.03	
47.33	2.43	0.26	327.62	28.66	11.96	476.89	7059.94	5234.14	5070.40	5018.28	6969.21	6061.38	304.13	269.30	247.73	
46.38	2.77	0.30	323.05	28.57	11.96	476.63	7054.63	5230.67	5067.15	5015.04	6962.96	6057.53	303.97	266.36	242.61	
43.69	2.76	0.31	312.90	28.56	11.96	477.04	7056.54	5231.18	5067.44	5015.37	6966.79	6057.80	304.38	266.49	228.55	
38.76	2.30	0.25	295.57	28.67	11.96	480.24	7210.15	5341.95	5173.96	5120.96	7125.27	6184.89	304.01	275.99	207.03	
41.34	2.28	0.25	305.39	28.68	11.96	482.73	7343.17	5438.44	5266.90	5213.05	7261.24	6295.82	303.36	281.28	224.81	
40.11	2.05	0.22	301.43	28.74	11.96	485.09	7455.02	5518.88	5344.20	5289.69	7377.10	6388.04	303.12	287.46	221.39	
39.13	2.08	0.22	297.61	28.73	11.96	485.96	7488.84	5542.79	5367.08	5312.40	7413.02	6415.30	303.23	288.52	216.87	
37.55	1.84	0.19	292.34	28.79	11.96	487.41	7565.26	5598.09	5420.31	5365.15	7491.44	6478.82	302.88	293.49	210.21	
37.46	1.85	0.19	291.98	28.79	11.96	488.74	7609.27	5628.68	5449.43	5394.08	7539.34	6513.47	303.26	295.12	210.86	
35.33	1.65	0.17	284.52	28.83	11.96	489.88	7684.42	5683.72	5502.58	5446.72	7615.00	6576.96	302.59	299.75	200.83	

SUMS					AVERAGE	SUMS						
617376.52	670748.49	176009.21	682143.52	287079.33	5173.80	35136.43	6493.83	28642.60	87819.16	6511.37	496.20	26.58
Energy Losses (kJ/kg of Dry Fuel)					Total Loss Rate	Total Loss	Chemical Loss 1	Sensible and Latent Loss	Total Output	Chem Loss 2	Grams Produced	
Flue Gas Constituent											CO	HC
CO	N <sub>2</sub>	CH <sub>4</sub>	H <sub>2</sub> O Comb	H <sub>2</sub> O Fuel MC								
186.65	5379.56	-136.52	1548.00	627.91	9200.08	0.00	0	0.00	0	0	0.00	0.00
546.97	8329.16	-185.58	1525.93	616.67	13222.51	1327.42	35	1292.17	560	35	5.31	-0.33
1327.39	5217.57	337.59	1485.67	624.96	10516.96	1291.48	200	1091.39	1017	200	15.74	0.74
856.95	4954.47	215.33	1574.70	656.10	9757.12	1294.01	138	1155.79	1199	138	10.89	0.51
1424.82	1930.07	569.19	1531.66	656.07	6756.14	745.57	214	531.38	1329	214	15.07	1.11
1165.98	1894.01	462.22	1539.05	653.70	6353.13	561.05	140	421.03	1099	140	9.88	0.72
923.61	1968.32	357.34	1545.35	651.01	6107.45	512.37	105	407.67	1065	105	7.44	0.53
826.01	1913.00	317.12	1542.07	647.60	5890.61	439.73	83	356.53	964	83	5.92	0.42
592.76	2042.80	212.84	1546.93	644.42	5722.24	384.76	53	331.93	879	53	3.83	0.25
514.85	2099.57	176.92	1547.43	642.85	5679.50	387.35	46	341.32	895	46	3.38	0.21
479.45	2069.09	162.26	1545.00	641.11	5585.04	385.29	43	342.09	912	43	3.18	0.20
715.56	1902.71	265.55	1526.17	638.38	5681.73	298.61	50	248.25	689	50	3.62	0.25
597.21	1968.19	209.65	1521.21	633.57	5578.24	274.18	39	235.41	650	39	2.83	0.18
519.94	1707.85	185.68	1510.66	628.01	5123.31	278.62	38	241.06	744	38	2.73	0.18
387.90	1777.99	123.37	1507.10	623.54	5007.68	225.38	23	202.84	621	23	1.69	0.10
382.33	1936.60	108.20	1498.46	619.24	5171.36	184.88	17	167.69	487	17	1.32	0.07
404.86	2174.91	98.81	1488.98	614.88	5469.30	169.33	15	154.03	413	15	1.21	0.05
528.57	2254.46	140.50	1475.76	611.38	5713.34	173.57	20	153.61	398	20	1.56	0.08
670.95	2203.61	198.33	1462.31	608.53	5826.81	170.32	25	145.35	379	25	1.90	0.10
683.81	2145.47	203.12	1455.57	605.95	5758.01	184.86	28	156.87	419	28	2.13	0.12
732.92	2084.80	224.21	1448.53	604.01	5738.96	216.05	35	180.61	492	35	2.68	0.15
736.86	2005.89	228.72	1444.74	602.64	5640.02	224.20	38	186.44	523	38	2.84	0.16
758.03	1950.71	239.39	1440.94	601.56	5595.05	211.94	37	174.76	500	37	2.79	0.16
596.11	1821.86	179.29	1445.66	600.72	5213.84	191.94	28	163.85	500	28	2.13	0.12
582.73	1764.11	175.98	1443.51	599.68	5119.28	196.09	29	167.48	524	29	2.17	0.12
678.83	1726.15	216.90	1436.34	598.60	5197.14	208.80	35	173.37	547	35	2.65	0.16
699.03	1644.09	230.49	1433.93	598.22	5122.79	221.21	40	181.68	591	40	2.93	0.18
797.12	1620.10	272.98	1429.08	598.18	5226.43	227.71	46	181.79	591	46	3.38	0.21
793.89	1569.32	275.22	1428.84	598.18	5160.49	223.87	46	178.19	592	46	3.35	0.21
662.26	1513.62	226.44	1437.93	599.70	4922.96	190.88	34	156.95	538	34	2.50	0.16
656.48	1592.03	220.51	1441.78	601.03	5017.91	170.72	29	141.35	469	29	2.17	0.13
591.71	1594.45	194.89	1447.30	602.13	4939.33	177.30	28	149.52	498	28	2.06	0.12
599.55	1581.03	199.49	1447.57	602.46	4935.49	185.45	30	155.90	521	30	2.19	0.13
531.12	1568.46	172.83	1452.39	603.22	4831.72	192.54	28	164.95	557	28	2.05	0.12
533.73	1574.97	174.04	1453.25	603.63	4845.59	200.27	29	171.49	577	29	2.14	0.13
476.34	1549.68	152.76	1457.48	604.39	4741.23	188.18	25	163.62	558	25	1.83	0.11

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 1 Data Summary**

Client: SBI  
Model: J.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/19/2022

*Data from 12/20/22 testing - reference only*

  
\_\_\_\_\_  
Technician Signature

7/12/2023  
\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

<b>Burn Rate (kg/hr):</b>	<b>3.52</b>
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	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	28.541	20.510	20.512	10.317
Average Gas Velocity in Dilution Tunnel (ft/sec)	23.46			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	26620.7			
Average Gas Meter Temperature (°F)	80.3	73.0	72.2	73.0
Total Sample Volume (dscf)	27.713	20.447	20.400	10.044
Average Tunnel Temperature (°F)	103.5			
Total Time of Test (min)	120			
Total Particulate Catch (mg)	0.0	3.2	3.0	1.3
Particulate Concentration, dry-standard (g/dscf)	0.000000	0.0001565	0.0001471	0.0001294
Total PM Emissions (g)	0.00	8.33	7.83	3.45
Particulate Emission Rate (g/hr)	0.00	4.17	3.91	3.45
Emissions Factor (g/kg)	-	1.23	1.16	-
Difference from Average Total Particulate Emissions (g)	-	0.25	0.25	-
Difference from Average Total Particulate Emissions (%)	-	3.1%	3.1%	-
Difference from Average Emissions Factor (g/kg)	-	0.04	0.04	-

Final Average Results	
Total Particulate Emissions (g)	8.08
Particulate Emission Rate (g/hr)	4.04
Emissions Factor (g/kg)	1.19
HHV Efficiency (%)	67.2%
LHV Efficiency (%)	72.0%
CO Emissions (g/min)	2.75

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: 82.5/Max: 87.5	OK
Face Velocity	< 30 ft/min	9.4	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:70.6/Max:89.7	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/19/22  
**Run:** 1  
**Control #:** 22-835  
**Test Duration:** 81  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	67.2%	72.0%
<b>Combustion Efficiency</b>	96.7%	96.7%
<b>Heat Transfer Efficiency</b>	69.5%	74.5%

<b>Output Rate (kJ/h)</b>	45,238	42,913	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	3.58	7.89	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	67,288	63,830	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	4.83	10.65	<b>dry lb</b>
<b>MC wet (%)</b>	17.03		
<b>MC dry (%)</b>	20.52		
<b>Particulate (g)</b>	8.08		
<b>CO (g)</b>	223		
<b>Test Duration (h)</b>	1.35		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.13	3.65
<b>g/kg Dry Fuel</b>	1.67	46.09
<b>g/h</b>	5.99	164.98
<b>g/min</b>	0.10	2.75
<b>lb/MM Btu Output</b>	0.31	8.48

<b>Air/Fuel Ratio (A/F)</b>	10.25
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VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/19/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.91  
 Max Allowable Start-up Fuel Weight (lbs): 4.36

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	15.75	3.17	In Range	29.0	21.5	18.3	22.9	In Range	2.58	1.17	
2	15.75	2.47	In Range	28.8	18.0	15.0	20.6	In Range	2.05	0.93	
3	16.00	2.88	In Range	25.5	17.9	16.6	20.0	In Range	2.40	1.09	
Core Load Wt. (lbs)		8.52	In Range								

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	16.00	3.64	In Range	26.8	16.7	17.2	20.2	In Range	3.03	1.37	
2	16.00	2.38	In Range	27.0	13.6	14.6	18.4	In Range	2.01	0.91	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.02	In Range								

Total Load Weight (lbs): 14.54 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: 101% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.1  
 Total Load Average Moisture Content (%DB): 20.5 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.0  
 Total Test Load Weight (dry basis): 12.06 lbs 5.47 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.84	In Range	10	10	10	10.0	In Range	2.58	1.17

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.30	In Range	25.5	17.2	19.7	20.8	In Range	3.56	1.61

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 1.70 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.3 to 1.60 lb  
 Actual Fuel Load Ending Weight (lb): 1.58 In Range

Total Weight All Fuel Added: 21.68 lbs, wet basis  
 18.20 lbs, dry basis  
 8.26 kg, dry basis

Total Weight All Fuel Burned (dry basis): 14.92 lbs  
 6.77 kg

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1  
 Test Start Time: 12:06  
 Test Type: High Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 120  
 High Fire Test Load Time (min): 39

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.40	29.49	29.45
Relative Humidity (%)	30.1	34.5	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	28.541 ft <sup>3</sup>		

**Sample Train Post-Test Leak Checks**

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

### DILUTION TUNNEL FLOW

**Traverse Data**

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.121	71
2	0.142	71
3	0.136	71
4	0.121	71
5	0.093	71
6	0.130	71
7	0.137	71
8	0.124	71
Center	0.141	71

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 23.72 ft/sec  
 V<sub>scnt</sub>: 25.19 ft/sec  
 F<sub>p</sub>: 0.942 [ratio]

Initial Tunnel Flow: 475.7 scf/min

Static Pressure: -0.293 in. H<sub>2</sub>O

### 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594



# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 1

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/19/2022

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

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.138	0.00	72.5	-0.44		7.22		71.2	72.7	84.8	71.0
1			0.136	0.00	73.1	0.37	-	7.13	-0.09	78.2	139.0	85.1	70.6
2			0.138	0.00	73.2	0.35	-	7.05	-0.08	76.2	162.6	85.8	70.9
3			0.137	0.00	73.3	0.36	-	6.98	-0.07	74.2	184.8	86.2	71.0
4			0.136	0.00	73.4	0.37	-	6.91	-0.07	74.3	209.2	86.9	71.2
5			0.138	0.00	73.4	0.37	-	6.81	-0.10	75.6	250.4	85.7	71.3
6			0.136	0.00	73.5	0.39	-	6.67	-0.14	77.6	310.7	84.9	71.4
7			0.136	0.00	73.5	0.42	-	6.53	-0.14	79.4	359.8	84.3	71.6
8			0.135	0.00	73.5	0.46	-	6.40	-0.13	80.5	385.6	83.9	71.8
9			0.135	0.00	73.5	0.46	-	6.26	-0.14	81.6	407.7	83.4	72.0
10	1.752	0.175	0.136	0.00	73.5	0.47	97	6.14	-0.12	81.7	407.7	83.3	72.2
11			0.135	0.00	73.5	0.48	-	6.01	-0.13	82.6	420.7	83.2	72.5
12			0.135	0.00	73.3	0.47	-	5.84	-0.17	84.1	447.8	83.0	72.8
13			0.135	0.00	73.3	0.50	-	5.70	-0.14	85.1	463.2	83.1	73.0
14			0.136	0.00	73.3	0.51	-	5.55	-0.15	85.7	471.2	83.2	73.3
15			0.134	0.00	73.2	0.49	-	5.41	-0.13	86.0	471.0	83.2	73.6
16			0.133	0.00	73.3	0.50	-	5.29	-0.13	85.8	463.6	83.3	73.9
17			0.134	0.00	73.3	0.50	-	5.16	-0.13	85.8	456.5	83.5	74.2
18			0.135	0.00	73.3	0.51	-	5.04	-0.13	85.9	457.2	83.5	74.4
19			0.134	0.00	73.3	0.50	-	4.92	-0.12	86.3	457.0	83.6	74.6
20	3.479	0.173	0.134	0.00	73.3	0.51	97	4.74	-0.17	87.7	479.7	83.7	74.9
21			0.131	0.00	73.3	0.52	-	4.55	-0.19	89.0	502.1	83.8	75.0
22			0.135	0.00	73.3	0.51	-	4.37	-0.18	89.8	513.5	84.0	75.4
23			0.133	0.00	73.1	0.51	-	4.17	-0.20	91.0	531.7	84.1	75.6
24			0.133	0.00	73.1	0.51	-	3.95	-0.22	92.3	548.9	84.1	75.9
25			0.132	0.00	73.1	0.52	-	3.73	-0.22	93.7	567.6	84.1	76.1
26			0.133	0.00	73.1	0.52	-	3.50	-0.22	94.3	572.4	83.9	76.6
27			0.134	0.00	73.1	0.50	-	3.31	-0.19	94.7	575.1	83.7	76.7
28			0.133	0.00	73.0	0.51	-	3.12	-0.19	94.7	571.0	83.4	77.4
29			0.131	0.00	73.0	0.52	-	2.96	-0.16	94.6	565.0	83.4	77.6
30	5.200	0.172	0.132	0.00	73.0	0.51	99	2.78	-0.18	97.3	564.2	83.3	77.1
31			0.132	0.00	73.0	0.53	-	2.64	-0.14	96.7	562.4	83.2	76.3
32			0.131	0.00	72.9	0.52	-	2.50	-0.14	95.2	557.2	83.2	77.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.133	0.00	72.9	0.51	-	2.37	-0.13	94.5	546.3	83.0	78.3
34			0.132	0.00	72.9	0.52	-	2.24	-0.13	94.1	535.6	82.9	78.6
35			0.131	0.00	72.9	0.52	-	2.12	-0.12	94.4	532.8	82.8	79.0
36			0.132	0.00	72.9	0.52	-	1.99	-0.13	94.1	530.2	82.7	79.4
37			0.132	0.00	72.8	0.54	-	1.87	-0.13	94.4	530.5	82.5	79.5
38			0.132	0.00	72.8	0.53	-	1.72	-0.15	95.2	529.2	82.5	80.4
39			0.128	0.00	72.7	0.55	-	14.41	12.70	130.4	535.3	82.7	78.5
40	6.916	0.172	0.129	0.00	72.7	0.55	101	14.29	-0.12	116.9	503.6	82.7	77.7
41			0.130	0.00	72.7	0.54	-	14.18	-0.11	102.0	494.3	82.7	78.2
42			0.130	0.00	72.6	0.53	-	14.04	-0.14	97.8	497.8	82.8	79.0
43			0.130	0.00	72.6	0.54	-	13.86	-0.18	97.0	515.3	82.7	80.1
44			0.131	0.00	72.7	0.53	-	13.70	-0.17	97.0	525.6	82.8	81.0
45			0.131	0.00	72.7	0.54	-	13.55	-0.15	96.8	526.2	82.8	81.5
46			0.132	0.00	72.8	0.52	-	13.40	-0.14	96.9	527.2	82.6	81.9
47			0.131	0.00	72.8	0.53	-	13.25	-0.16	97.0	525.9	82.7	82.4
48			0.131	0.00	72.9	0.53	-	13.08	-0.17	97.5	529.8	82.7	82.7
49			0.131	0.00	72.8	0.53	-	12.91	-0.17	98.0	535.6	82.7	83.2
50	8.613	0.170	0.132	0.00	72.8	0.53	100	12.75	-0.15	98.1	536.7	82.7	83.4
51			0.132	0.00	72.7	0.53	-	12.59	-0.16	98.6	541.1	82.7	83.3
52			0.130	0.00	72.7	0.53	-	12.42	-0.17	99.0	544.0	82.7	84.1
53			0.130	0.00	72.7	0.52	-	12.26	-0.16	99.2	544.4	82.7	83.6
54			0.130	0.00	72.7	0.54	-	12.09	-0.16	99.5	544.8	82.8	84.7
55			0.131	0.00	72.8	0.53	-	11.92	-0.18	101.8	551.0	82.8	84.9
56			0.129	0.00	72.8	0.54	-	11.73	-0.19	104.9	560.8	82.9	83.3
57			0.130	0.00	72.9	0.54	-	11.53	-0.20	106.8	570.6	82.8	82.5
58			0.130	0.00	72.8	0.54	-	11.36	-0.17	108.1	583.3	82.8	81.3
59			0.129	0.00	72.8	0.54	-	11.18	-0.18	107.9	591.9	82.8	78.3
60	10.317	0.170	0.129	0.00	72.8	0.54	100	11.01	-0.16	107.9	592.6	83.0	78.4
61			0.129	0.00	72.8	0.55	-	10.81	-0.21	108.0	595.4	83.0	79.1
62			0.129	0.00	72.8	0.55	-	10.61	-0.20	108.7	601.1	83.0	78.4
63			0.127	0.00	72.9	0.56	-	10.34	-0.26	110.3	629.5	83.3	78.5
64			0.127	0.00	72.8	0.60	-	10.10	-0.24	111.2	637.6	83.1	78.1
65			0.127	0.00	72.8	0.61	-	9.86	-0.25	112.3	650.9	83.2	78.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.127	0.00	72.8	0.61	-	9.58	-0.27	113.0	661.8	83.3	78.7
67			0.127	0.00	72.8	0.63	-	9.31	-0.27	114.0	673.8	83.4	78.9
68			0.126	0.00	72.8	0.64	-	9.06	-0.26	114.8	685.8	83.4	78.1
69			0.126	0.00	72.8	0.66	-	8.81	-0.25	115.5	692.5	83.4	78.3
70	12.012	0.169	0.125	0.00	72.9	0.66	101	8.53	-0.28	116.2	698.9	83.5	79.0
71			0.125	0.00	72.9	0.66	-	8.29	-0.24	116.8	702.4	83.6	78.8
72			0.124	0.00	72.8	0.68	-	8.03	-0.26	117.3	706.7	83.7	78.8
73			0.127	0.00	72.7	0.68	-	7.78	-0.25	117.4	708.2	83.8	79.3
74			0.126	0.00	72.7	0.69	-	7.52	-0.25	117.5	706.4	83.7	79.5
75			0.126	0.00	72.7	0.68	-	7.29	-0.23	117.9	706.2	83.9	79.4
76			0.126	0.00	72.7	0.70	-	7.05	-0.24	118.0	704.8	83.9	78.8
77			0.127	0.00	72.7	0.71	-	6.80	-0.25	117.8	699.8	84.1	79.8
78			0.127	0.00	72.7	0.72	-	6.58	-0.22	117.6	694.7	84.1	79.3
79			0.127	0.00	72.8	0.73	-	6.36	-0.22	117.6	689.9	84.1	80.1
80	13.705	0.169	0.126	0.00	72.8	0.74	102	6.17	-0.19	116.8	679.0	84.1	79.7
81			0.126	0.00	72.7	0.74	-	5.97	-0.21	116.5	666.1	84.1	80.5
82			0.127	0.00	72.7	0.74	-	5.76	-0.20	116.8	657.1	84.2	81.3
83			0.126	0.00	72.7	0.74	-	5.56	-0.21	117.0	649.4	84.2	82.5
84			0.126	0.00	72.7	0.73	-	5.34	-0.22	117.3	644.1	84.4	82.7
85			0.127	0.00	72.8	0.74	-	5.16	-0.18	117.2	639.0	84.5	82.9
86			0.127	0.00	72.8	0.73	-	4.98	-0.18	117.3	635.4	84.7	82.7
87			0.126	0.00	72.9	0.74	-	4.81	-0.17	117.6	634.2	84.7	84.4
88			0.125	0.00	72.9	0.73	-	4.63	-0.18	117.7	633.0	84.8	85.3
89			0.126	0.00	72.9	0.72	-	4.47	-0.16	117.8	632.0	84.8	85.6
90	15.402	0.170	0.127	0.00	72.9	0.73	102	4.29	-0.18	117.7	633.0	84.8	84.5
91			0.127	0.00	72.9	0.72	-	4.16	-0.13	117.7	629.5	84.8	85.2
92			0.127	0.00	72.9	0.75	-	4.01	-0.15	117.4	622.6	84.9	84.2
93			0.127	0.00	72.9	0.75	-	3.87	-0.14	117.2	615.9	85.0	85.7
94			0.127	0.00	72.9	0.75	-	3.72	-0.15	116.8	610.3	85.0	84.4
95			0.128	0.00	73.0	0.74	-	3.60	-0.13	116.7	605.8	84.9	85.4
96			0.128	0.00	72.9	0.75	-	3.50	-0.10	116.6	603.7	84.9	85.7
97			0.126	0.00	72.9	0.75	-	3.36	-0.14	116.5	600.8	84.9	84.9
98			0.128	0.00	72.9	0.75	-	3.25	-0.11	115.4	599.1	84.9	85.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.128	0.00	73.0	0.75	-	3.12	-0.13	115.5	599.0	84.7	84.7
100	17.104	0.170	0.128	0.00	73.0	0.76	102	2.99	-0.13	115.6	598.9	84.8	84.2
101			0.128	0.00	73.0	0.76	-	2.86	-0.13	115.8	597.9	84.8	85.1
102			0.128	0.00	72.9	0.77	-	2.74	-0.12	115.8	596.1	84.9	85.0
103			0.129	0.00	72.9	0.77	-	2.62	-0.12	115.6	594.0	84.9	86.6
104			0.128	0.00	73.0	0.78	-	2.52	-0.11	115.3	588.9	85.0	87.1
105			0.128	0.00	73.0	0.78	-	2.41	-0.11	115.0	582.0	85.1	86.6
106			0.129	0.00	73.0	0.77	-	2.34	-0.06	114.5	575.6	85.0	86.1
107			0.130	0.00	73.0	0.78	-	2.26	-0.08	114.0	565.6	85.0	87.5
108			0.129	0.00	73.1	0.79	-	2.21	-0.05	113.3	553.5	85.1	87.1
109			0.130	0.00	73.1	0.80	-	2.13	-0.08	112.9	543.2	85.1	86.5
110	18.805	0.170	0.129	0.00	73.1	0.79	101	2.08	-0.05	112.5	536.0	85.1	86.0
111			0.131	0.00	73.0	0.80	-	2.04	-0.04	108.9	528.8	85.0	87.0
112			0.131	0.00	73.1	0.79	-	1.98	-0.06	105.8	522.7	84.9	86.5
113			0.130	0.00	73.2	0.80	-	1.90	-0.08	107.5	519.1	84.9	86.7
114			0.131	0.00	73.3	0.79	-	1.85	-0.05	110.1	517.0	85.0	89.7
115			0.131	0.00	73.3	0.78	-	1.81	-0.04	110.7	514.6	85.2	87.4
116			0.130	0.00	73.5	0.79	-	1.76	-0.06	109.5	510.3	85.2	87.8
117			0.130	0.00	73.5	0.78	-	1.72	-0.04	109.1	506.9	85.4	89.2
118			0.130	0.00	73.6	0.78	-	1.65	-0.07	108.8	505.0	85.5	89.1
119			0.130	0.00	73.7	0.78	-	1.61	-0.04	108.8	501.5	85.4	89.5
120	20.510	0.171	0.130	0.00	73.7	0.77	100	1.58	-0.03	108.8	495.7	85.4	88.6
Avg/Tot	20.510	0.171	0.130	0.00	73.0	0.60	100			103.5	546.1	83.9	80.3

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	71.9	-0.27		83.5	0.000	2.52	0.144	29.1	36.9
1			0.00	72.3	0.43	-	83.5	-0.036	1.89	0.077	30.1	43.3
2			0.00	72.3	0.48	-	84.4	-0.035	2.16	0.156	28.1	40.6
3			0.00	72.4	0.45	-	85.0	-0.042	3.19	0.164	31.1	41.0
4			0.00	72.5	0.41	-	85.6	-0.049	9.06	0.209	31.9	41.7
5			0.00	72.5	0.52	-	86.1	-0.059	12.59	0.191	33.3	43.9
6			0.00	72.6	0.53	-	86.7	-0.068	12.60	0.178	34.8	46.8
7			0.00	72.6	0.51	-	87.2	-0.072	12.39	0.175	34.5	48.4
8			0.00	72.6	0.64	-	87.5	-0.074	11.31	0.226	33.4	48.2
9			0.00	72.6	0.55	-	87.4	-0.077	11.62	0.185	32.8	48.9
10	1.732	0.173	0.00	72.6	0.57	96	87.3	-0.074	11.35	0.186	31.4	47.8
11			0.00	72.5	0.57	-	87.3	-0.078	11.63	0.171	31.6	48.6
12			0.00	72.4	0.62	-	87.2	-0.081	11.98	0.166	32.2	50.5
13			0.00	72.4	0.68	-	87.1	-0.083	12.80	0.230	31.0	50.4
14			0.00	72.3	0.66	-	86.8	-0.082	12.33	0.198	30.5	50.4
15			0.00	72.3	0.59	-	86.6	-0.081	12.12	0.231	29.9	50.2
16			0.00	72.3	0.62	-	86.5	-0.080	12.47	0.240	29.0	49.3
17			0.00	72.3	0.61	-	86.2	-0.080	13.02	0.291	28.7	48.7
18			0.00	72.3	0.60	-	86.0	-0.081	12.93	0.189	29.0	49.3
19			0.00	72.3	0.68	-	85.8	-0.082	13.28	0.198	29.0	49.5
20	3.449	0.172	0.00	72.3	0.67	97	85.8	-0.086	13.77	0.253	30.1	51.8
21			0.00	72.3	0.69	-	85.7	-0.087	14.24	0.276	30.5	53.2
22			0.00	72.3	0.69	-	85.6	-0.090	14.28	0.336	29.9	53.2
23			0.00	72.2	0.69	-	85.6	-0.092	14.41	0.270	30.3	54.7
24			0.00	72.2	0.63	-	85.7	-0.092	14.46	0.322	30.2	55.8
25			0.00	72.2	0.63	-	85.7	-0.095	14.82	0.371	30.0	56.7
26			0.00	72.2	0.61	-	85.6	-0.095	15.32	0.575	28.6	55.9
27			0.00	72.2	0.64	-	85.4	-0.095	15.79	0.628	27.8	55.6
28			0.00	72.1	0.61	-	85.1	-0.093	16.06	0.764	26.9	54.7
29			0.00	72.1	0.61	-	84.8	-0.092	16.52	0.779	26.1	53.8
30	5.175	0.173	0.00	72.1	0.65	99	84.7	-0.093	17.04	0.951	25.0	54.3
31			0.00	72.0	0.61	-	84.6	-0.092	16.84	1.055	24.3	53.6
32			0.00	72.0	0.68	-	84.3	-0.091	16.90	1.112	24.6	52.7
33			0.00	72.0	0.64	-	83.9	-0.089	16.72	1.206	24.2	51.8
34			0.00	72.0	0.68	-	83.6	-0.089	16.77	1.233	23.8	51.1
35			0.00	72.0	0.63	-	83.4	-0.090	16.83	1.253	23.9	51.1
36			0.00	72.0	0.61	-	83.2	-0.088	16.83	1.228	23.7	50.9
37			0.00	71.9	0.63	-	83.0	-0.090	16.88	1.164	23.5	50.9
38			0.00	71.9	0.69	-	82.9	-0.089	16.77	1.174	23.1	50.7

Data from 12/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	71.8	0.64	-	85.1	-0.094	16.80	1.120	13.8	59.0
40	6.887	0.171	0.00	71.8	0.62	100	85.3	-0.086	16.77	1.074	14.1	55.6
41			0.00	71.8	0.68	-	84.4	-0.085	16.71	1.164	19.9	53.6
42			0.00	71.8	0.69	-	83.7	-0.087	16.73	1.256	22.8	53.2
43			0.00	71.8	0.66	-	83.3	-0.090	16.80	1.263	24.3	54.3
44			0.00	71.7	0.65	-	83.2	-0.090	16.62	1.394	24.3	54.1
45			0.00	71.9	0.70	-	83.1	-0.091	16.68	1.430	24.3	54.0
46			0.00	71.8	0.68	-	83.0	-0.090	16.82	1.351	24.3	54.0
47			0.00	71.9	0.65	-	82.9	-0.091	16.80	1.375	24.2	54.0
48			0.00	71.9	0.69	-	82.9	-0.090	17.00	1.252	24.5	54.5
49			0.00	71.9	0.62	-	82.9	-0.092	17.19	1.306	24.6	55.0
50	8.595	0.171	0.00	71.9	0.66	100	82.8	-0.092	17.20	1.350	24.2	54.7
51			0.00	71.9	0.64	-	82.8	-0.092	17.45	1.601	24.2	55.2
52			0.00	71.9	0.61	-	82.8	-0.092	17.41	1.589	24.0	55.2
53			0.00	71.8	0.67	-	82.7	-0.092	17.36	1.533	23.9	55.2
54			0.00	71.8	0.70	-	82.7	-0.092	17.42	1.535	23.8	55.2
55			0.00	71.9	0.63	-	82.7	-0.094	17.52	1.380	23.4	56.3
56			0.00	71.9	0.61	-	82.9	-0.095	17.50	1.331	22.0	57.4
57			0.00	72.0	0.68	-	83.1	-0.096	17.67	1.220	21.4	58.1
58			0.00	71.9	0.68	-	83.3	-0.098	17.77	1.173	21.1	59.2
59			0.00	71.9	0.65	-	83.4	-0.098	17.63	1.114	21.5	59.4
60	10.299	0.170	0.00	71.9	0.69	100	83.4	-0.096	17.50	0.986	21.3	59.2
61			0.00	71.9	0.65	-	83.6	-0.097	17.44	0.829	21.5	59.5
62			0.00	72.0	0.65	-	83.8	-0.099	17.36	0.662	21.6	60.3
63			0.00	72.0	0.67	-	84.0	-0.101	17.01	0.722	22.0	61.9
64			0.00	72.0	0.70	-	84.1	-0.101	16.82	0.438	21.7	62.4
65			0.00	72.0	0.74	-	84.2	-0.104	15.63	0.411	21.6	63.0
66			0.00	72.1	0.79	-	84.4	-0.104	14.87	0.298	21.1	63.0
67			0.00	72.1	0.78	-	84.6	-0.105	14.66	0.226	20.7	63.3
68			0.00	72.1	0.78	-	85.0	-0.106	14.04	0.195	20.5	63.7
69			0.00	72.1	0.75	-	85.2	-0.106	13.69	0.108	20.2	63.9
70	11.991	0.169	0.00	72.1	0.76	101	85.4	-0.106	13.44	0.069	19.8	64.0
71			0.00	72.1	0.81	-	85.7	-0.106	13.03	0.038	19.6	64.0
72			0.00	72.1	0.82	-	85.8	-0.106	12.68	0.022	19.4	64.0
73			0.00	72.0	0.82	-	85.9	-0.106	11.99	0.000	19.1	63.9
74			0.00	72.1	0.78	-	86.1	-0.106	11.19	0.000	18.8	63.7
75			0.00	72.1	0.79	-	86.3	-0.106	11.04	0.000	18.6	63.5
76			0.00	72.1	0.87	-	86.4	-0.105	10.90	0.000	18.4	63.3
77			0.00	72.1	0.81	-	86.5	-0.105	10.45	0.000	18.3	63.0

Data from 12/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	72.0	0.88	-	86.5	-0.105	9.93	0.000	18.0	62.4
79			0.00	72.1	0.86	-	86.5	-0.104	9.83	0.000	17.9	62.2
80	13.693	0.170	0.00	72.1	0.89	102	86.7	-0.102	9.77	0.000	17.6	61.3
81			0.00	72.1	0.84	-	86.7	-0.101	9.66	0.000	17.4	60.4
82			0.00	72.0	0.88	-	86.8	-0.101	9.59	0.000	16.9	59.9
83			0.00	72.0	0.85	-	87.0	-0.100	9.53	0.000	16.7	59.7
84			0.00	72.0	0.85	-	87.1	-0.100	9.46	0.000	16.3	59.5
85			0.00	72.1	0.93	-	87.1	-0.100	9.37	0.000	16.2	59.2
86			0.00	72.1	0.84	-	86.3	-0.099	9.26	0.000	16.1	59.0
87			0.00	72.1	0.92	-	86.1	-0.100	9.15	0.014	16.1	59.2
88			0.00	72.1	0.91	-	85.9	-0.099	8.98	0.031	16.0	59.2
89			0.00	72.1	0.89	-	85.9	-0.100	8.50	0.024	15.9	59.2
90	15.398	0.171	0.00	72.1	0.86	102	85.9	-0.099	8.10	0.038	15.8	58.8
91			0.00	72.1	0.91	-	85.9	-0.099	7.81	0.104	15.5	58.3
92			0.00	72.2	0.86	-	85.9	-0.098	7.56	0.172	15.3	57.7
93			0.00	72.2	0.92	-	85.8	-0.097	7.29	0.291	15.2	57.4
94			0.00	72.2	0.89	-	85.7	-0.098	7.22	0.279	15.0	56.8
95			0.00	72.2	0.88	-	85.7	-0.097	7.09	0.348	14.9	56.5
96			0.00	72.2	0.90	-	85.6	-0.097	6.94	0.419	14.9	56.3
97			0.00	72.2	0.93	-	85.5	-0.097	6.81	0.446	15.1	56.7
98			0.00	72.2	0.90	-	85.4	-0.096	7.04	0.385	15.5	56.3
99			0.00	72.2	0.97	-	85.3	-0.096	6.63	0.506	15.4	56.3
100	17.097	0.170	0.00	72.2	0.90	102	85.4	-0.097	6.53	0.484	15.2	56.1
101			0.00	72.3	0.89	-	85.3	-0.095	6.51	0.460	15.0	55.8
102			0.00	72.3	0.89	-	85.3	-0.095	6.18	0.632	14.8	55.6
103			0.00	72.3	0.92	-	85.2	-0.095	6.14	0.685	14.6	55.0
104			0.00	72.3	0.93	-	85.2	-0.095	6.10	0.695	14.4	54.5
105			0.00	72.3	0.90	-	85.1	-0.094	6.09	0.719	14.2	54.0
106			0.00	72.3	0.91	-	85.0	-0.093	6.14	0.760	14.1	53.2
107			0.00	72.4	0.96	-	84.9	-0.092	6.15	0.789	13.8	52.3
108			0.00	72.3	0.91	-	84.9	-0.090	6.06	0.735	13.6	51.4
109			0.00	72.4	0.94	-	84.6	-0.089	6.04	0.685	13.5	50.9
110	18.806	0.171	0.00	72.4	0.93	102	84.5	-0.089	6.05	0.657	13.5	50.5
111			0.00	72.4	0.95	-	84.3	-0.087	6.18	0.596	14.1	49.6
112			0.00	72.4	0.92	-	84.0	-0.088	6.20	0.633	15.1	48.6
113			0.00	72.5	0.94	-	83.9	-0.088	6.24	0.632	15.0	48.6
114			0.00	72.6	0.96	-	84.0	-0.087	6.17	0.632	13.9	49.5
115			0.00	72.7	0.91	-	83.9	-0.087	6.23	0.605	13.7	49.5
116			0.00	72.8	0.92	-	83.9	-0.086	6.11	0.568	13.8	48.9

Data from 12/19/2022 testing - Reference only



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.00	72.8	0.90	-	83.8	-0.086	6.07	0.577	14.0	48.7
118			0.00	72.9	0.90	-	83.6	-0.086	6.08	0.520	14.0	48.6
119			0.00	73.0	0.89	-	83.5	-0.085	6.04	0.502	13.9	48.6
120	20.512	0.171	0.00	73.0	0.88	101	83.5	-0.084	5.96	0.494	13.9	48.4
Avg/Tot	20.512	0.171	0.00	72.2	0.74	100	85.0	-0.090	11.84	0.559	21.54	54.611

Data from 12/2022 testing - Reference only

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	72.5	-0.44		84.8
1			0.00	73.1	0.37	-	85.1
2			0.00	73.2	0.35	-	85.8
3			0.00	73.3	0.36	-	86.2
4			0.00	73.4	0.37	-	86.9
5			0.00	73.4	0.37	-	85.7
6			0.00	73.5	0.38	-	84.9
7			0.00	73.5	0.42	-	84.3
8			0.00	73.5	0.46	-	83.9
9			0.00	73.5	0.46	-	83.4
10	1.752	0.175	0.00	73.5	0.47	97	83.3
11			0.00	73.5	0.48	-	83.2
12			0.00	73.3	0.47	-	83.0
13			0.00	73.3	0.50	-	83.1
14			0.00	73.3	0.51	-	83.2
15			0.00	73.2	0.49	-	83.2
16			0.00	73.3	0.50	-	83.3
17			0.00	73.3	0.50	-	83.5
18			0.00	73.3	0.51	-	83.5
19			0.00	73.3	0.50	-	83.6
20	3.479	0.173	0.00	73.3	0.51	97	83.7
21			0.00	73.3	0.52	-	83.8
22			0.00	73.3	0.51	-	84.0
23			0.00	73.1	0.51	-	84.1
24			0.00	73.1	0.51	-	84.1
25			0.00	73.1	0.52	-	84.1
26			0.00	73.1	0.52	-	83.9
27			0.00	73.1	0.50	-	83.7
28			0.00	73.0	0.51	-	83.4
29			0.00	73.0	0.52	-	83.4
30	5.200	0.172	0.00	73.0	0.51	98	83.3
31			0.00	73.0	0.53	-	83.2

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	72.9	0.52	-	83.2
33			0.00	72.9	0.51	-	83.0
34			0.00	72.9	0.52	-	82.9
35			0.00	72.9	0.52	-	82.8
36			0.00	72.9	0.52	-	82.7
37			0.00	72.8	0.54	-	82.5
38			0.00	72.8	0.53	-	82.5
39			0.00	72.7	0.55	-	82.7
40	6.916	0.172	0.00	72.7	0.55	100	82.7
41			0.00	72.7	0.54	-	82.7
42			0.00	72.6	0.53	-	82.8
43			0.00	72.6	0.54	-	82.7
44			0.00	72.7	0.53	-	82.8
45			0.00	72.7	0.54	-	82.8
46			0.00	72.8	0.52	-	82.6
47			0.00	72.8	0.53	-	82.7
48			0.00	72.9	0.53	-	82.7
49			0.00	72.8	0.53	-	82.7
50	8.613	0.170	0.00	72.8	0.53	99	82.7
51			0.00	72.7	0.53	-	82.7
52			0.00	72.7	0.53	-	82.7
53			0.00	72.7	0.52	-	82.7
54			0.00	72.7	0.54	-	82.8
55			0.00	72.8	0.53	-	82.8
56			0.00	72.8	0.54	-	82.9
57			0.00	72.9	0.54	-	82.8
58			0.00	72.8	0.54	-	82.8
59			0.00	72.8	0.54	-	82.8
60	10.317	0.170	0.00	72.8	0.54	99	83.0
Avg/Tot	10.317	0.172	0.00	73.0	0.49	98	83.4

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
0	72.7	72.2	72.9	72.6	72.3	72.5	0
1	86.5	72.2	72.9	72.5	72.3	75.3	0
2	106.4	72.2	73.3	72.5	72.3	79.4	0
3	127.8	72.2	74.4	72.7	72.5	83.9	0
4	153.4	72.1	76.3	73.1	72.8	89.5	0
5	191.0	72.2	78.6	73.7	73.3	97.8	0
6	244.0	72.1	81.4	74.7	73.9	109.2	0
7	304.7	72.2	84.7	75.9	74.9	122.5	0
8	359.8	72.4	88.5	77.6	76.1	134.9	0
9	402.7	72.6	92.7	79.8	77.7	145.1	0
10	432.4	72.9	97.3	82.6	79.7	153.0	0
11	451.7	73.3	102.0	85.9	82.0	159.0	0
12	476.4	73.8	106.6	89.7	84.7	166.2	0
13	504.4	74.4	111.4	94.0	87.6	174.4	0
14	532.2	75.2	116.7	98.7	90.9	182.7	0
15	554.0	76.1	122.3	103.7	94.5	190.1	0
16	562.2	77.2	128.0	108.8	98.3	194.9	0
17	563.1	78.6	133.7	113.9	102.4	198.3	0
18	562.3	80.3	139.3	119.0	106.5	201.5	0
19	560.0	82.4	145.4	124.5	110.9	204.6	0
20	567.4	84.7	151.8	129.9	115.3	209.8	0
21	587.1	87.4	158.5	135.2	120.0	217.6	0
22	608.2	90.3	165.8	140.9	124.9	226.0	0
23	629.5	93.6	173.4	146.9	130.1	234.7	0
24	651.9	97.2	181.5	153.2	135.4	243.8	0
25	675.5	101.2	189.9	159.3	140.8	253.3	0
26	697.4	105.4	198.4	165.8	146.4	262.7	0
27	714.9	109.8	207.0	172.6	152.4	271.3	0
28	726.8	114.6	215.5	179.6	158.8	279.1	0
29	734.6	119.6	224.2	186.9	165.5	286.2	0
30	740.5	124.9	233.1	194.3	172.7	293.1	0
31	745.6	130.4	242.2	201.7	179.8	299.9	0
32	748.3	136.2	251.7	209.6	187.0	306.6	0
33	744.9	142.1	261.5	217.5	194.2	312.0	0
34	736.8	148.0	271.2	225.4	201.3	316.5	0
35	726.8	153.9	280.3	233.2	208.4	320.5	0
36	718.0	159.9	288.6	240.9	215.3	324.5	0
37	710.9	165.8	296.5	248.4	222.0	328.7	0
38	705.2	171.8	303.8	255.6	228.6	333.0	0
39	695.7	178.2	313.3	262.5	235.3	337.0	0
40	675.3	184.4	323.3	269.2	241.6	338.8	0
41	663.8	189.7	327.5	275.7	247.5	340.9	0
42	655.4	195.6	327.4	282.2	253.4	342.8	0
43	654.5	201.1	325.1	288.0	258.9	345.5	0
44	655.6	206.3	321.7	292.7	263.7	348.0	0
45	656.9	211.1	318.0	296.4	268.2	350.1	0
46	656.1	215.5	314.4	299.3	271.9	351.4	0
47	654.0	219.5	311.0	301.4	275.2	352.2	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
48	653.3	223.4	308.1	302.8	277.9	353.1	0	
49	654.9	227.0	305.5	304.1	280.0	354.3	0	
50	657.8	230.3	303.2	304.8	281.9	355.6	0	
51	661.5	233.5	301.2	305.3	283.3	357.0	0	
52	665.0	236.3	299.5	305.5	284.6	358.2	0	
53	667.2	238.9	298.1	305.5	285.8	359.1	0	
54	669.7	241.3	297.0	305.4	287.0	360.1	0	
55	674.0	243.5	296.1	305.2	288.2	361.4	0	
56	679.9	245.1	295.1	304.9	289.3	362.9	0	
57	688.0	246.9	294.3	304.4	290.4	364.8	0	
58	696.2	247.9	293.8	303.1	290.9	366.4	0	
59	705.7	248.8	293.2	302.1	291.8	368.3	0	
60	712.6	249.7	293.1	301.1	293.0	369.9	0	
61	718.2	250.7	293.3	300.0	294.3	371.3	0	
62	723.8	251.7	293.8	299.3	296.0	372.9	0	
63	738.4	252.9	294.4	298.6	298.0	376.5	0	
64	759.7	254.3	295.7	298.1	300.2	381.6	0	
65	783.4	255.7	297.6	297.9	302.7	387.4	0	
66	805.5	257.1	300.1	297.7	305.3	393.2	0	
67	823.1	258.8	303.1	298.0	308.3	398.3	0	
68	839.0	260.6	305.5	298.4	311.7	403.2	0	
69	853.3	262.5	311.3	299.0	315.3	408.1	0	
70	866.4	264.7	314.3	299.9	319.2	412.9	0	
71	878.0	266.9	318.6	301.0	323.4	417.6	0	
72	887.0	269.4	323.2	302.4	328.0	422.0	0	
73	894.3	272.1	328.3	304.0	332.7	426.3	0	
74	898.6	274.9	333.5	305.6	337.6	430.0	0	
75	901.4	277.6	338.9	307.7	342.7	433.7	0	
76	903.2	280.5	344.4	309.8	348.0	437.2	0	
77	904.2	283.5	350.0	312.5	353.4	440.7	0	
78	903.9	286.6	355.7	315.3	359.3	444.2	0	
79	902.5	290.0	361.3	318.3	365.0	447.4	0	
80	898.7	293.4	366.8	321.6	370.7	450.3	0	
81	892.1	297.1	372.1	325.4	376.7	452.7	0	
82	883.4	301.4	377.3	329.7	382.7	454.9	0	
83	874.6	305.6	382.6	333.8	388.5	457.0	0	
84	866.0	309.6	387.6	337.7	394.1	459.0	0	
85	857.8	313.7	392.5	341.4	399.3	460.9	0	
86	851.7	317.5	397.2	344.9	404.1	463.1	0	
87	847.4	321.4	401.9	348.3	408.5	465.5	0	
88	845.6	325.2	406.6	351.3	412.5	468.2	0	
89	845.5	328.9	411.4	354.4	416.3	471.3	0	
90	845.9	332.4	416.2	357.1	419.8	474.3	0	
91	843.7	335.9	421.0	359.9	423.0	476.7	0	
92	838.9	339.4	425.7	362.8	426.0	478.6	0	
93	832.1	342.8	430.2	365.2	428.8	479.8	0	
94	824.7	346.2	434.5	367.7	431.4	480.9	0	
95	817.1	349.5	438.4	370.0	433.7	481.7	0	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
96	810.8	352.5	442.1	372.1	435.9	482.7	0
97	804.8	355.7	445.5	374.2	437.9	483.6	0
98	799.9	358.2	449.3	375.7	439.3	484.5	0
99	797.9	361.8	453.2	378.1	440.6	486.3	0
100	798.6	365.2	457.0	380.1	442.2	488.6	0
101	799.5	368.4	460.3	382.2	443.4	490.8	0
102	798.8	371.5	463.4	384.3	444.2	492.4	0
103	798.1	374.6	466.2	386.4	445.1	494.1	0
104	796.7	377.4	468.8	388.3	445.8	495.4	0
105	794.2	380.0	471.2	390.3	446.0	496.3	0
106	790.1	382.5	473.2	392.1	446.2	496.8	0
107	783.2	384.7	474.9	393.8	446.1	496.5	0
108	773.1	386.7	476.2	395.6	446.0	495.5	0
109	760.4	388.5	477.2	397.1	445.6	493.8	0
110	748.2	390.2	477.6	398.6	445.0	491.9	0
111	738.8	391.9	477.8	399.9	444.8	490.7	0
112	729.2	393.9	477.7	401.3	444.5	489.3	0
113	721.0	395.7	477.2	402.1	444.0	488.0	0
114	714.7	396.5	476.2	403.2	442.5	486.6	0
115	709.8	397.2	475.0	403.9	440.5	485.3	0
116	706.2	398.0	473.7	404.5	438.9	484.2	0
117	703.1	399.1	472.4	404.9	437.4	483.4	0
118	699.8	400.3	471.1	405.1	435.7	482.4	0
119	695.9	401.2	469.7	405.2	433.9	481.2	0
120	690.3	402.2	468.4	405.1	432.1	479.6	0
Average	692.4	235.9	308.0	273.1	286.1	359	0

Data from 12/20/22 testing - Reference only

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0116	188.4	191.5	3.1
	<b>B</b>	H0117	187.2	189.9	2.7
	<b>C - 1st Hour</b>	H0118	188.6	189.2	0.6
	<b>Amb</b>	H0146	90.8	90.8	0.0
<b>Probes</b>	<b>A</b>	11A	116864.8	116864.8	0.0
	<b>B</b>	11B	117338.7	117338.8	0.1
	<b>C - 1st Hour</b>	11C	116185.0	116185.7	0.7
<b>O-rings</b>	<b>A</b>	11A	3424.2	3424.3	0.1
	<b>B</b>	11B	4234.3	4234.5	0.2
	<b>C - 1st Hour</b>	11C	3589.3	3589.2	0.0*

\*Negative value corrected to zero

Placed in Dessicator on:

<b>Filters</b>	<b>A</b>	191.8	12/19 2:16	191.4	12/31 11:57	191.5	1/3 9:39		
	<b>B</b>	190.3	12/19 2:16	190.0	12/31 11:57	189.9	1/3 9:39		
	<b>C - 1st Hour</b>	189.3	12/19 2:16	189.2	12/31 11:58	189.2	1/3 9:40		
	<b>Amb</b>	91.2	12/19 2:16	90.8	12/31 12:12	90.8	1/3 9:40		
<b>Probes</b>	<b>A</b>			116865.0	12/31 12:11	116864.8	1/3 9:40		
	<b>B</b>			117339.0	12/31 12:12	117338.8	1/3 9:40		
	<b>C - 1st Hour</b>			116185.9	12/31 12:12	116185.7	1/3 9:40		
<b>O-Rings</b>	<b>A</b>			3424.3	12/31 11:57	3424.3	1/3 9:40		
	<b>B</b>			4234.5	12/31 11:57	4234.5	1/3 9:40		
	<b>C - 1st Hour</b>			3589.2	12/31 11:57	3589.2	1/3 9:40		

<b>Train A Aggregate, mg:</b>	<b>3.2</b>
<b>Train B Aggregate, mg:</b>	<b>3.0</b>
<b>Train C Aggregate, mg:</b>	<b>1.3</b>
<b>Ambient Aggregate, mg:</b>	<b>0.0</b>

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 1 Data Summary**

Client: SBI  
Model: J.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/19/2022

*Data from 12/2022 testing - reference only*

  
\_\_\_\_\_  
Technician Signature

7/12/2023  
\_\_\_\_\_  
Date



## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

<b>Burn Rate (kg/hr):</b>	<b>3.52</b>
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	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	28.541	20.510	20.512	10.317
Average Gas Velocity in Dilution Tunnel (ft/sec)	23.46			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	26620.7			
Average Gas Meter Temperature (°F)	80.3	73.0	72.2	73.0
Total Sample Volume (dscf)	27.713	20.447	20.400	10.044
Average Tunnel Temperature (°F)	103.5			
Total Time of Test (min)	120			
Total Particulate Catch (mg)	0.0	3.2	3.0	1.3
Particulate Concentration, dry-standard (g/dscf)	0.000000	0.0001565	0.0001471	0.0001294
Total PM Emissions (g)	0.00	8.33	7.83	3.45
Particulate Emission Rate (g/hr)	0.00	4.17	3.91	3.45
Emissions Factor (g/kg)	-	1.23	1.16	-
Difference from Average Total Particulate Emissions (g)	-	0.25	0.25	-
Difference from Average Total Particulate Emissions (%)	-	3.1%	3.1%	-
Difference from Average Emissions Factor (g/kg)	-	0.04	0.04	-

Final Average Results	
Total Particulate Emissions (g)	8.08
Particulate Emission Rate (g/hr)	4.04
Emissions Factor (g/kg)	1.19
HHV Efficiency (%)	67.2%
LHV Efficiency (%)	72.0%
CO Emissions (g/min)	2.75

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: 82.5/Max: 87.5	OK
Face Velocity	< 30 ft/min	9.4	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:70.6/Max:89.7	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/19/22  
**Run:** 1  
**Control #:** 22-835  
**Test Duration:** 81  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	67.2%	72.0%
<b>Combustion Efficiency</b>	96.7%	96.7%
<b>Heat Transfer Efficiency</b>	69.5%	74.5%

<b>Output Rate (kJ/h)</b>	45,238	42,913	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	3.58	7.89	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	67,288	63,830	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	4.83	10.65	<b>dry lb</b>
<b>MC wet (%)</b>	17.03		
<b>MC dry (%)</b>	20.52		
<b>Particulate (g)</b>	8.08		
<b>CO (g)</b>	223		
<b>Test Duration (h)</b>	1.35		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.13	3.65
<b>g/kg Dry Fuel</b>	1.67	46.09
<b>g/h</b>	5.99	164.98
<b>g/min</b>	0.10	2.75
<b>lb/MM Btu Output</b>	0.31	8.48

<b>Air/Fuel Ratio (A/F)</b>	10.25
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VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/19/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.91  
 Max Allowable Start-up Fuel Weight (lbs): 4.36

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	15.75	3.17	In Range	29.0	21.5	18.3	22.9	In Range	2.58	1.17	
2	15.75	2.47	In Range	28.8	18.0	15.0	20.6	In Range	2.05	0.93	
3	16.00	2.88	In Range	25.5	17.9	16.6	20.0	In Range	2.40	1.09	
Core Load Wt. (lbs)		8.52	In Range								

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	16.00	3.64	In Range	26.8	16.7	17.2	20.2	In Range	3.03	1.37	
2	16.00	2.38	In Range	27.0	13.6	14.6	18.4	In Range	2.01	0.91	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.02	In Range								

Total Load Weight (lbs): 14.54 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: 101% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.1  
 Total Load Average Moisture Content (%DB): 20.5 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.0  
 Total Test Load Weight (dry basis): 12.06 lbs 5.47 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.84	In Range	10	10	10	10.0	In Range	2.58	1.17

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.30	In Range	25.5	17.2	19.7	20.8	In Range	3.56	1.61

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 1.70 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.3 to 1.60 lb  
 Actual Fuel Load Ending Weight (lb): 1.58 In Range

Total Weight All Fuel Added: 21.68 lbs, wet basis  
 18.20 lbs, dry basis  
 8.26 kg, dry basis

Total Weight All Fuel Burned (dry basis): 14.92 lbs  
 6.77 kg

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1  
 Test Start Time: 12:06  
 Test Type: High Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 120  
 High Fire Test Load Time (min): 39

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.40	29.49	29.45
Relative Humidity (%)	30.1	34.5	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	28.541 ft <sup>3</sup>		

**Sample Train Post-Test Leak Checks**

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

### DILUTION TUNNEL FLOW

**Traverse Data**

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.121	71
2	0.142	71
3	0.136	71
4	0.121	71
5	0.093	71
6	0.130	71
7	0.137	71
8	0.124	71
Center	0.141	71

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 23.72 ft/sec  
 V<sub>scant</sub>: 25.19 ft/sec  
 F<sub>p</sub>: 0.942 [ratio]

Initial Tunnel Flow: 475.7 scf/min

Static Pressure: -0.293 in. H<sub>2</sub>O

### 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 1

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/19/2022

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

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.138	0.00	72.5	-0.44		7.22		71.2	72.7	84.8	71.0
1			0.136	0.00	73.1	0.37	-	7.13	-0.09	78.2	139.0	85.1	70.6
2			0.138	0.00	73.2	0.35	-	7.05	-0.08	76.2	162.6	85.8	70.9
3			0.137	0.00	73.3	0.36	-	6.98	-0.07	74.2	184.8	86.2	71.0
4			0.136	0.00	73.4	0.37	-	6.91	-0.07	74.3	209.2	86.9	71.2
5			0.138	0.00	73.4	0.37	-	6.81	-0.10	75.6	250.4	85.7	71.3
6			0.136	0.00	73.5	0.39	-	6.67	-0.14	77.6	310.7	84.9	71.4
7			0.136	0.00	73.5	0.42	-	6.53	-0.14	79.4	359.8	84.3	71.6
8			0.135	0.00	73.5	0.46	-	6.40	-0.13	80.5	385.6	83.9	71.8
9			0.135	0.00	73.5	0.46	-	6.26	-0.14	81.6	407.7	83.4	72.0
10	1.752	0.175	0.136	0.00	73.5	0.47	97	6.14	-0.12	81.7	407.7	83.3	72.2
11			0.135	0.00	73.5	0.48	-	6.01	-0.13	82.6	420.7	83.2	72.5
12			0.135	0.00	73.3	0.47	-	5.84	-0.17	84.1	447.8	83.0	72.8
13			0.135	0.00	73.3	0.50	-	5.70	-0.14	85.1	463.2	83.1	73.0
14			0.136	0.00	73.3	0.51	-	5.55	-0.15	85.7	471.2	83.2	73.3
15			0.134	0.00	73.2	0.49	-	5.41	-0.13	86.0	471.0	83.2	73.6
16			0.133	0.00	73.3	0.50	-	5.29	-0.13	85.8	463.6	83.3	73.9
17			0.134	0.00	73.3	0.50	-	5.16	-0.13	85.8	456.5	83.5	74.2
18			0.135	0.00	73.3	0.51	-	5.04	-0.13	85.9	457.2	83.5	74.4
19			0.134	0.00	73.3	0.50	-	4.92	-0.12	86.3	457.0	83.6	74.6
20	3.479	0.173	0.134	0.00	73.3	0.51	97	4.74	-0.17	87.7	479.7	83.7	74.9
21			0.131	0.00	73.3	0.52	-	4.55	-0.19	89.0	502.1	83.8	75.0
22			0.135	0.00	73.3	0.51	-	4.37	-0.18	89.8	513.5	84.0	75.4
23			0.133	0.00	73.1	0.51	-	4.17	-0.20	91.0	531.7	84.1	75.6
24			0.133	0.00	73.1	0.51	-	3.95	-0.22	92.3	548.9	84.1	75.9
25			0.132	0.00	73.1	0.52	-	3.73	-0.22	93.7	567.6	84.1	76.1
26			0.133	0.00	73.1	0.52	-	3.50	-0.22	94.3	572.4	83.9	76.6
27			0.134	0.00	73.1	0.50	-	3.31	-0.19	94.7	575.1	83.7	76.7
28			0.133	0.00	73.0	0.51	-	3.12	-0.19	94.7	571.0	83.4	77.4
29			0.131	0.00	73.0	0.52	-	2.96	-0.16	94.6	565.0	83.4	77.6
30	5.200	0.172	0.132	0.00	73.0	0.51	99	2.78	-0.18	97.3	564.2	83.3	77.1
31			0.132	0.00	73.0	0.53	-	2.64	-0.14	96.7	562.4	83.2	76.3
32			0.131	0.00	72.9	0.52	-	2.50	-0.14	95.2	557.2	83.2	77.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.133	0.00	72.9	0.51	-	2.37	-0.13	94.5	546.3	83.0	78.3
34			0.132	0.00	72.9	0.52	-	2.24	-0.13	94.1	535.6	82.9	78.6
35			0.131	0.00	72.9	0.52	-	2.12	-0.12	94.4	532.8	82.8	79.0
36			0.132	0.00	72.9	0.52	-	1.99	-0.13	94.1	530.2	82.7	79.4
37			0.132	0.00	72.8	0.54	-	1.87	-0.13	94.4	530.5	82.5	79.5
38			0.132	0.00	72.8	0.53	-	1.72	-0.15	95.2	529.2	82.5	80.4
39			0.128	0.00	72.7	0.55	-	14.41	12.70	130.4	535.3	82.7	78.5
40	6.916	0.172	0.129	0.00	72.7	0.55	101	14.29	-0.12	116.9	503.6	82.7	77.7
41			0.130	0.00	72.7	0.54	-	14.18	-0.11	102.0	494.3	82.7	78.2
42			0.130	0.00	72.6	0.53	-	14.04	-0.14	97.8	497.8	82.8	79.0
43			0.130	0.00	72.6	0.54	-	13.86	-0.18	97.0	515.3	82.7	80.1
44			0.131	0.00	72.7	0.53	-	13.70	-0.17	97.0	525.6	82.8	81.0
45			0.131	0.00	72.7	0.54	-	13.55	-0.15	96.8	526.2	82.8	81.5
46			0.132	0.00	72.8	0.52	-	13.40	-0.14	96.9	527.2	82.6	81.9
47			0.131	0.00	72.3	0.53	-	13.25	-0.16	97.0	525.9	82.7	82.4
48			0.131	0.00	72.9	0.53	-	13.08	-0.17	97.5	529.8	82.7	82.7
49			0.131	0.00	72.8	0.53	-	12.91	-0.17	98.0	535.6	82.7	83.2
50	8.613	0.170	0.132	0.00	72.8	0.53	100	12.75	-0.15	98.1	536.7	82.7	83.4
51			0.132	0.00	72.7	0.53	-	12.59	-0.16	98.6	541.1	82.7	83.3
52			0.130	0.00	72.7	0.53	-	12.42	-0.17	99.0	544.0	82.7	84.1
53			0.130	0.00	72.7	0.52	-	12.26	-0.16	99.2	544.4	82.7	83.6
54			0.130	0.00	72.7	0.54	-	12.09	-0.16	99.5	544.8	82.8	84.7
55			0.131	0.00	72.8	0.53	-	11.92	-0.18	101.8	551.0	82.8	84.9
56			0.129	0.00	72.8	0.54	-	11.73	-0.19	104.9	560.8	82.9	83.3
57			0.130	0.00	72.9	0.54	-	11.53	-0.20	106.8	570.6	82.8	82.5
58			0.130	0.00	72.8	0.54	-	11.36	-0.17	108.1	583.3	82.8	81.3
59			0.129	0.00	72.8	0.54	-	11.18	-0.18	107.9	591.9	82.8	78.3
60	10.317	0.170	0.129	0.00	72.8	0.54	100	11.01	-0.16	107.9	592.6	83.0	78.4
61			0.129	0.00	72.8	0.55	-	10.81	-0.21	108.0	595.4	83.0	79.1
62			0.129	0.00	72.8	0.55	-	10.61	-0.20	108.7	601.1	83.0	78.4
63			0.127	0.00	72.9	0.56	-	10.34	-0.26	110.3	629.5	83.3	78.5
64			0.127	0.00	72.8	0.60	-	10.10	-0.24	111.2	637.6	83.1	78.1
65			0.127	0.00	72.8	0.61	-	9.86	-0.25	112.3	650.9	83.2	78.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.127	0.00	72.8	0.61	-	9.58	-0.27	113.0	661.8	83.3	78.7
67			0.127	0.00	72.8	0.63	-	9.31	-0.27	114.0	673.8	83.4	78.9
68			0.126	0.00	72.8	0.64	-	9.06	-0.26	114.8	685.8	83.4	78.1
69			0.126	0.00	72.8	0.66	-	8.81	-0.25	115.5	692.5	83.4	78.3
70	12.012	0.169	0.125	0.00	72.9	0.66	101	8.53	-0.28	116.2	698.9	83.5	79.0
71			0.125	0.00	72.9	0.66	-	8.29	-0.24	116.8	702.4	83.6	78.8
72			0.124	0.00	72.8	0.68	-	8.03	-0.26	117.3	706.7	83.7	78.8
73			0.127	0.00	72.7	0.68	-	7.78	-0.25	117.4	708.2	83.8	79.3
74			0.126	0.00	72.7	0.69	-	7.52	-0.25	117.5	706.4	83.7	79.5
75			0.126	0.00	72.7	0.68	-	7.29	-0.23	117.9	706.2	83.9	79.4
76			0.126	0.00	72.7	0.70	-	7.05	-0.24	118.0	704.8	83.9	78.8
77			0.127	0.00	72.7	0.71	-	6.80	-0.25	117.8	699.8	84.1	79.8
78			0.127	0.00	72.7	0.72	-	6.58	-0.22	117.6	694.7	84.1	79.3
79			0.127	0.00	72.8	0.73	-	6.36	-0.22	117.6	689.9	84.1	80.1
80	13.705	0.169	0.126	0.00	72.8	0.74	102	6.17	-0.19	116.8	679.0	84.1	79.7
81			0.126	0.00	72.7	0.74	-	5.97	-0.21	116.5	666.1	84.1	80.5
82			0.127	0.00	72.7	0.74	-	5.76	-0.20	116.8	657.1	84.2	81.3
83			0.126	0.00	72.7	0.74	-	5.56	-0.21	117.0	649.4	84.2	82.5
84			0.126	0.00	72.7	0.73	-	5.34	-0.22	117.3	644.1	84.4	82.7
85			0.127	0.00	72.8	0.74	-	5.16	-0.18	117.2	639.0	84.5	82.9
86			0.127	0.00	72.8	0.73	-	4.98	-0.18	117.3	635.4	84.7	82.7
87			0.126	0.00	72.9	0.74	-	4.81	-0.17	117.6	634.2	84.7	84.4
88			0.125	0.00	72.9	0.73	-	4.63	-0.18	117.7	633.0	84.8	85.3
89			0.126	0.00	72.9	0.72	-	4.47	-0.16	117.8	632.0	84.8	85.6
90	15.402	0.170	0.127	0.00	72.9	0.73	102	4.29	-0.18	117.7	633.0	84.8	84.5
91			0.127	0.00	72.9	0.72	-	4.16	-0.13	117.7	629.5	84.8	85.2
92			0.127	0.00	72.9	0.75	-	4.01	-0.15	117.4	622.6	84.9	84.2
93			0.127	0.00	72.9	0.75	-	3.87	-0.14	117.2	615.9	85.0	85.7
94			0.127	0.00	72.9	0.75	-	3.72	-0.15	116.8	610.3	85.0	84.4
95			0.128	0.00	73.0	0.74	-	3.60	-0.13	116.7	605.8	84.9	85.4
96			0.128	0.00	72.9	0.75	-	3.50	-0.10	116.6	603.7	84.9	85.7
97			0.126	0.00	72.9	0.75	-	3.36	-0.14	116.5	600.8	84.9	84.9
98			0.128	0.00	72.9	0.75	-	3.25	-0.11	115.4	599.1	84.9	85.2



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.128	0.00	73.0	0.75	-	3.12	-0.13	115.5	599.0	84.7	84.7
100	17.104	0.170	0.128	0.00	73.0	0.76	102	2.99	-0.13	115.6	598.9	84.8	84.2
101			0.128	0.00	73.0	0.76	-	2.86	-0.13	115.8	597.9	84.8	85.1
102			0.128	0.00	72.9	0.77	-	2.74	-0.12	115.8	596.1	84.9	85.0
103			0.129	0.00	72.9	0.77	-	2.62	-0.12	115.6	594.0	84.9	86.6
104			0.128	0.00	73.0	0.78	-	2.52	-0.11	115.3	588.9	85.0	87.1
105			0.128	0.00	73.0	0.78	-	2.41	-0.11	115.0	582.0	85.1	86.6
106			0.129	0.00	73.0	0.77	-	2.34	-0.06	114.5	575.6	85.0	86.1
107			0.130	0.00	73.0	0.78	-	2.26	-0.08	114.0	565.6	85.0	87.5
108			0.129	0.00	73.1	0.79	-	2.21	-0.05	113.3	553.5	85.1	87.1
109			0.130	0.00	73.1	0.80	-	2.13	-0.08	112.9	543.2	85.1	86.5
110	18.805	0.170	0.129	0.00	73.1	0.79	101	2.08	-0.05	112.5	536.0	85.1	86.0
111			0.131	0.00	73.0	0.80	-	2.04	-0.04	108.9	528.8	85.0	87.0
112			0.131	0.00	73.1	0.79	-	1.98	-0.06	105.8	522.7	84.9	86.5
113			0.130	0.00	73.2	0.80	-	1.90	-0.08	107.5	519.1	84.9	86.7
114			0.131	0.00	73.3	0.79	-	1.85	-0.05	110.1	517.0	85.0	89.7
115			0.131	0.00	73.3	0.78	-	1.81	-0.04	110.7	514.6	85.2	87.4
116			0.130	0.00	73.5	0.79	-	1.76	-0.06	109.5	510.3	85.2	87.8
117			0.130	0.00	73.5	0.78	-	1.72	-0.04	109.1	506.9	85.4	89.2
118			0.130	0.00	73.6	0.78	-	1.65	-0.07	108.8	505.0	85.5	89.1
119			0.130	0.00	73.7	0.78	-	1.61	-0.04	108.8	501.5	85.4	89.5
120	20.510	0.171	0.130	0.00	73.7	0.77	100	1.58	-0.03	108.8	495.7	85.4	88.6
Avg/Tot	20.510	0.171	0.130	0.00	73.0	0.60	100			103.5	546.1	83.9	80.3

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	71.9	-0.27		83.5	0.000	2.52	0.144	29.1	36.9
1			0.00	72.3	0.43	-	83.5	-0.036	1.89	0.077	30.1	43.3
2			0.00	72.3	0.48	-	84.4	-0.035	2.16	0.156	28.1	40.6
3			0.00	72.4	0.45	-	85.0	-0.042	3.19	0.164	31.1	41.0
4			0.00	72.5	0.41	-	85.6	-0.049	9.06	0.209	31.9	41.7
5			0.00	72.5	0.52	-	86.1	-0.059	12.59	0.191	33.3	43.9
6			0.00	72.6	0.53	-	86.7	-0.068	12.60	0.178	34.8	46.8
7			0.00	72.6	0.51	-	87.2	-0.072	12.39	0.175	34.5	48.4
8			0.00	72.6	0.64	-	87.5	-0.074	11.31	0.226	33.4	48.2
9			0.00	72.6	0.55	-	87.4	-0.077	11.62	0.185	32.8	48.9
10	1.732	0.173	0.00	72.6	0.57	96	87.3	-0.074	11.35	0.186	31.4	47.8
11			0.00	72.5	0.57	-	87.3	-0.078	11.63	0.171	31.6	48.6
12			0.00	72.4	0.62	-	87.2	-0.081	11.98	0.166	32.2	50.5
13			0.00	72.4	0.68	-	87.1	-0.083	12.80	0.230	31.0	50.4
14			0.00	72.3	0.66	-	86.8	-0.082	12.33	0.198	30.5	50.4
15			0.00	72.3	0.59	-	86.6	-0.081	12.12	0.231	29.9	50.2
16			0.00	72.3	0.62	-	86.5	-0.080	12.47	0.240	29.0	49.3
17			0.00	72.3	0.61	-	86.2	-0.080	13.02	0.291	28.7	48.7
18			0.00	72.3	0.60	-	86.0	-0.081	12.93	0.189	29.0	49.3
19			0.00	72.3	0.68	-	85.8	-0.082	13.28	0.198	29.0	49.5
20	3.449	0.172	0.00	72.3	0.67	97	85.8	-0.086	13.77	0.253	30.1	51.8
21			0.00	72.3	0.69	-	85.7	-0.087	14.24	0.276	30.5	53.2
22			0.00	72.3	0.69	-	85.6	-0.090	14.28	0.336	29.9	53.2
23			0.00	72.2	0.69	-	85.6	-0.092	14.41	0.270	30.3	54.7
24			0.00	72.2	0.63	-	85.7	-0.092	14.46	0.322	30.2	55.8
25			0.00	72.2	0.63	-	85.7	-0.095	14.82	0.371	30.0	56.7
26			0.00	72.2	0.61	-	85.6	-0.095	15.32	0.575	28.6	55.9
27			0.00	72.2	0.64	-	85.4	-0.095	15.79	0.628	27.8	55.6
28			0.00	72.1	0.61	-	85.1	-0.093	16.06	0.764	26.9	54.7
29			0.00	72.1	0.61	-	84.8	-0.092	16.52	0.779	26.1	53.8
30	5.175	0.173	0.00	72.1	0.65	99	84.7	-0.093	17.04	0.951	25.0	54.3
31			0.00	72.0	0.61	-	84.6	-0.092	16.84	1.055	24.3	53.6
32			0.00	72.0	0.68	-	84.3	-0.091	16.90	1.112	24.6	52.7
33			0.00	72.0	0.64	-	83.9	-0.089	16.72	1.206	24.2	51.8
34			0.00	72.0	0.68	-	83.6	-0.089	16.77	1.233	23.8	51.1
35			0.00	72.0	0.63	-	83.4	-0.090	16.83	1.253	23.9	51.1
36			0.00	72.0	0.61	-	83.2	-0.088	16.83	1.228	23.7	50.9
37			0.00	71.9	0.63	-	83.0	-0.090	16.88	1.164	23.5	50.9
38			0.00	71.9	0.69	-	82.9	-0.089	16.77	1.174	23.1	50.7

Data from 12/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	71.8	0.64	-	85.1	-0.094	16.80	1.120	13.8	59.0
40	6.887	0.171	0.00	71.8	0.62	100	85.3	-0.086	16.77	1.074	14.1	55.6
41			0.00	71.8	0.68	-	84.4	-0.085	16.71	1.164	19.9	53.6
42			0.00	71.8	0.69	-	83.7	-0.087	16.73	1.256	22.8	53.2
43			0.00	71.8	0.66	-	83.3	-0.090	16.80	1.263	24.3	54.3
44			0.00	71.7	0.65	-	83.2	-0.090	16.62	1.394	24.3	54.1
45			0.00	71.9	0.70	-	83.1	-0.091	16.68	1.430	24.3	54.0
46			0.00	71.8	0.68	-	83.0	-0.090	16.82	1.351	24.3	54.0
47			0.00	71.9	0.65	-	82.9	-0.091	16.80	1.375	24.2	54.0
48			0.00	71.9	0.69	-	82.9	-0.090	17.00	1.252	24.5	54.5
49			0.00	71.9	0.62	-	82.9	-0.092	17.19	1.306	24.6	55.0
50	8.595	0.171	0.00	71.9	0.66	100	82.8	-0.092	17.20	1.350	24.2	54.7
51			0.00	71.9	0.64	-	82.8	-0.092	17.45	1.601	24.2	55.2
52			0.00	71.9	0.61	-	82.8	-0.092	17.41	1.589	24.0	55.2
53			0.00	71.8	0.67	-	82.7	-0.092	17.36	1.533	23.9	55.2
54			0.00	71.8	0.70	-	82.7	-0.092	17.42	1.535	23.8	55.2
55			0.00	71.9	0.63	-	82.7	-0.094	17.52	1.380	23.4	56.3
56			0.00	71.9	0.61	-	82.9	-0.095	17.50	1.331	22.0	57.4
57			0.00	72.0	0.68	-	83.1	-0.096	17.67	1.220	21.4	58.1
58			0.00	71.9	0.68	-	83.3	-0.098	17.77	1.173	21.1	59.2
59			0.00	71.9	0.65	-	83.4	-0.098	17.63	1.114	21.5	59.4
60	10.299	0.170	0.00	71.9	0.69	100	83.4	-0.096	17.50	0.986	21.3	59.2
61			0.00	71.9	0.65	-	83.6	-0.097	17.44	0.829	21.5	59.5
62			0.00	72.0	0.65	-	83.8	-0.099	17.36	0.662	21.6	60.3
63			0.00	72.0	0.67	-	84.0	-0.101	17.01	0.722	22.0	61.9
64			0.00	72.0	0.70	-	84.1	-0.101	16.82	0.438	21.7	62.4
65			0.00	72.0	0.74	-	84.2	-0.104	15.63	0.411	21.6	63.0
66			0.00	72.1	0.79	-	84.4	-0.104	14.87	0.298	21.1	63.0
67			0.00	72.1	0.78	-	84.6	-0.105	14.66	0.226	20.7	63.3
68			0.00	72.1	0.78	-	85.0	-0.106	14.04	0.195	20.5	63.7
69			0.00	72.1	0.75	-	85.2	-0.106	13.69	0.108	20.2	63.9
70	11.991	0.169	0.00	72.1	0.76	101	85.4	-0.106	13.44	0.069	19.8	64.0
71			0.00	72.1	0.81	-	85.7	-0.106	13.03	0.038	19.6	64.0
72			0.00	72.1	0.82	-	85.8	-0.106	12.68	0.022	19.4	64.0
73			0.00	72.0	0.82	-	85.9	-0.106	11.99	0.000	19.1	63.9
74			0.00	72.1	0.78	-	86.1	-0.106	11.19	0.000	18.8	63.7
75			0.00	72.1	0.79	-	86.3	-0.106	11.04	0.000	18.6	63.5
76			0.00	72.1	0.87	-	86.4	-0.105	10.90	0.000	18.4	63.3
77			0.00	72.1	0.81	-	86.5	-0.105	10.45	0.000	18.3	63.0

Data from 12/19/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	72.0	0.88	-	86.5	-0.105	9.93	0.000	18.0	62.4
79			0.00	72.1	0.86	-	86.5	-0.104	9.83	0.000	17.9	62.2
80	13.693	0.170	0.00	72.1	0.89	102	86.7	-0.102	9.77	0.000	17.6	61.3
81			0.00	72.1	0.84	-	86.7	-0.101	9.66	0.000	17.4	60.4
82			0.00	72.0	0.88	-	86.8	-0.101	9.59	0.000	16.9	59.9
83			0.00	72.0	0.85	-	87.0	-0.100	9.53	0.000	16.7	59.7
84			0.00	72.0	0.85	-	87.1	-0.100	9.46	0.000	16.3	59.5
85			0.00	72.1	0.93	-	87.1	-0.100	9.37	0.000	16.2	59.2
86			0.00	72.1	0.84	-	86.3	-0.099	9.26	0.000	16.1	59.0
87			0.00	72.1	0.92	-	86.1	-0.100	9.15	0.014	16.1	59.2
88			0.00	72.1	0.91	-	85.9	-0.099	8.98	0.031	16.0	59.2
89			0.00	72.1	0.89	-	85.8	-0.100	8.50	0.024	15.9	59.2
90	15.398	0.171	0.00	72.1	0.86	102	85.9	-0.099	8.10	0.038	15.8	58.8
91			0.00	72.1	0.91	-	85.9	-0.099	7.81	0.104	15.5	58.3
92			0.00	72.2	0.86	-	85.9	-0.098	7.56	0.172	15.3	57.7
93			0.00	72.2	0.92	-	85.8	-0.097	7.29	0.291	15.2	57.4
94			0.00	72.2	0.89	-	85.7	-0.098	7.22	0.279	15.0	56.8
95			0.00	72.2	0.88	-	85.7	-0.097	7.09	0.348	14.9	56.5
96			0.00	72.2	0.90	-	85.6	-0.097	6.94	0.419	14.9	56.3
97			0.00	72.2	0.93	-	85.5	-0.097	6.81	0.446	15.1	56.7
98			0.00	72.2	0.90	-	85.4	-0.096	7.04	0.385	15.5	56.3
99			0.00	72.2	0.97	-	85.3	-0.096	6.63	0.506	15.4	56.3
100	17.097	0.170	0.00	72.2	0.90	102	85.4	-0.097	6.53	0.484	15.2	56.1
101			0.00	72.3	0.89	-	85.3	-0.095	6.51	0.460	15.0	55.8
102			0.00	72.3	0.89	-	85.3	-0.095	6.18	0.632	14.8	55.6
103			0.00	72.3	0.92	-	85.2	-0.095	6.14	0.685	14.6	55.0
104			0.00	72.3	0.93	-	85.2	-0.095	6.10	0.695	14.4	54.5
105			0.00	72.3	0.90	-	85.1	-0.094	6.09	0.719	14.2	54.0
106			0.00	72.3	0.91	-	85.0	-0.093	6.14	0.760	14.1	53.2
107			0.00	72.4	0.96	-	84.9	-0.092	6.15	0.789	13.8	52.3
108			0.00	72.3	0.91	-	84.9	-0.090	6.06	0.735	13.6	51.4
109			0.00	72.4	0.94	-	84.6	-0.089	6.04	0.685	13.5	50.9
110	18.806	0.171	0.00	72.4	0.93	102	84.5	-0.089	6.05	0.657	13.5	50.5
111			0.00	72.4	0.95	-	84.3	-0.087	6.18	0.596	14.1	49.6
112			0.00	72.4	0.92	-	84.0	-0.088	6.20	0.633	15.1	48.6
113			0.00	72.5	0.94	-	83.9	-0.088	6.24	0.632	15.0	48.6
114			0.00	72.6	0.96	-	84.0	-0.087	6.17	0.632	13.9	49.5
115			0.00	72.7	0.91	-	83.9	-0.087	6.23	0.605	13.7	49.5
116			0.00	72.8	0.92	-	83.9	-0.086	6.11	0.568	13.8	48.9

Data from 12/19/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.00	72.8	0.90	-	83.8	-0.086	6.07	0.577	14.0	48.7
118			0.00	72.9	0.90	-	83.6	-0.086	6.08	0.520	14.0	48.6
119			0.00	73.0	0.89	-	83.5	-0.085	6.04	0.502	13.9	48.6
120	20.512	0.171	0.00	73.0	0.88	101	83.5	-0.084	5.96	0.494	13.9	48.4
Avg/Tot	20.512	0.171	0.00	72.2	0.74	100	85.0	-0.090	11.84	0.559	21.54	54.611

Data from 12/2022 testing - Reference only

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	72.5	-0.44		84.8
1			0.00	73.1	0.37	-	85.1
2			0.00	73.2	0.35	-	85.8
3			0.00	73.3	0.36	-	86.2
4			0.00	73.4	0.37	-	86.9
5			0.00	73.4	0.37	-	85.7
6			0.00	73.5	0.38	-	84.9
7			0.00	73.5	0.42	-	84.3
8			0.00	73.5	0.46	-	83.9
9			0.00	73.5	0.46	-	83.4
10	1.752	0.175	0.00	73.5	0.47	97	83.3
11			0.00	73.5	0.48	-	83.2
12			0.00	73.3	0.47	-	83.0
13			0.00	73.3	0.50	-	83.1
14			0.00	73.3	0.51	-	83.2
15			0.00	73.2	0.49	-	83.2
16			0.00	73.3	0.50	-	83.3
17			0.00	73.3	0.50	-	83.5
18			0.00	73.3	0.51	-	83.5
19			0.00	73.3	0.50	-	83.6
20	3.479	0.173	0.00	73.3	0.51	97	83.7
21			0.00	73.3	0.52	-	83.8
22			0.00	73.3	0.51	-	84.0
23			0.00	73.1	0.51	-	84.1
24			0.00	73.1	0.51	-	84.1
25			0.00	73.1	0.52	-	84.1
26			0.00	73.1	0.52	-	83.9
27			0.00	73.1	0.50	-	83.7
28			0.00	73.0	0.51	-	83.4
29			0.00	73.0	0.52	-	83.4
30	5.200	0.172	0.00	73.0	0.51	98	83.3
31			0.00	73.0	0.53	-	83.2

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	72.9	0.52	-	83.2
33			0.00	72.9	0.51	-	83.0
34			0.00	72.9	0.52	-	82.9
35			0.00	72.9	0.52	-	82.8
36			0.00	72.9	0.52	-	82.7
37			0.00	72.8	0.54	-	82.5
38			0.00	72.8	0.53	-	82.5
39			0.00	72.7	0.55	-	82.7
40	6.916	0.172	0.00	72.7	0.55	100	82.7
41			0.00	72.7	0.54	-	82.7
42			0.00	72.6	0.53	-	82.8
43			0.00	72.6	0.54	-	82.7
44			0.00	72.7	0.53	-	82.8
45			0.00	72.7	0.54	-	82.8
46			0.00	72.8	0.52	-	82.6
47			0.00	72.8	0.53	-	82.7
48			0.00	72.9	0.53	-	82.7
49			0.00	72.8	0.53	-	82.7
50	8.613	0.170	0.00	72.8	0.53	99	82.7
51			0.00	72.7	0.53	-	82.7
52			0.00	72.7	0.53	-	82.7
53			0.00	72.7	0.52	-	82.7
54			0.00	72.7	0.54	-	82.8
55			0.00	72.8	0.53	-	82.8
56			0.00	72.8	0.54	-	82.9
57			0.00	72.9	0.54	-	82.8
58			0.00	72.8	0.54	-	82.8
59			0.00	72.8	0.54	-	82.8
60	10.317	0.170	0.00	72.8	0.54	99	83.0
Avg/Tot	10.317	0.172	0.00	73.0	0.49	98	83.4

Data from 12/2022 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
0	72.7	72.2	72.9	72.6	72.3	72.5	0
1	86.5	72.2	72.9	72.5	72.3	75.3	0
2	106.4	72.2	73.3	72.5	72.3	79.4	0
3	127.8	72.2	74.4	72.7	72.5	83.9	0
4	153.4	72.1	76.3	73.1	72.8	89.5	0
5	191.0	72.2	78.6	73.7	73.3	97.8	0
6	244.0	72.1	81.4	74.7	73.9	109.2	0
7	304.7	72.2	84.7	75.9	74.9	122.5	0
8	359.8	72.4	88.5	77.6	76.1	134.9	0
9	402.7	72.6	92.7	79.8	77.7	145.1	0
10	432.4	72.9	97.3	82.6	79.7	153.0	0
11	451.7	73.3	102.0	85.9	82.0	159.0	0
12	476.4	73.8	106.6	89.7	84.7	166.2	0
13	504.4	74.4	111.4	94.0	87.6	174.4	0
14	532.2	75.2	116.7	98.7	90.9	182.7	0
15	554.0	76.1	122.3	103.7	94.5	190.1	0
16	562.2	77.2	128.0	108.8	98.3	194.9	0
17	563.1	78.6	133.7	113.9	102.4	198.3	0
18	562.3	80.3	139.3	119.0	106.5	201.5	0
19	560.0	82.4	145.4	124.5	110.9	204.6	0
20	567.4	84.7	151.8	129.9	115.3	209.8	0
21	587.1	87.4	158.5	135.2	120.0	217.6	0
22	608.2	90.3	165.8	140.9	124.9	226.0	0
23	629.5	93.6	173.4	146.9	130.1	234.7	0
24	651.9	97.2	181.5	153.2	135.4	243.8	0
25	675.5	101.2	189.9	159.3	140.8	253.3	0
26	697.4	105.4	198.4	165.8	146.4	262.7	0
27	714.9	109.8	207.0	172.6	152.4	271.3	0
28	726.8	114.6	215.5	179.6	158.8	279.1	0
29	734.6	119.6	224.2	186.9	165.5	286.2	0
30	740.5	124.9	233.1	194.3	172.7	293.1	0
31	745.6	130.4	242.2	201.7	179.8	299.9	0
32	748.3	136.2	251.7	209.6	187.0	306.6	0
33	744.9	142.1	261.5	217.5	194.2	312.0	0
34	736.8	148.0	271.2	225.4	201.3	316.5	0
35	726.8	153.9	280.3	233.2	208.4	320.5	0
36	718.0	159.9	288.6	240.9	215.3	324.5	0
37	710.9	165.8	296.5	248.4	222.0	328.7	0
38	705.2	171.8	303.8	255.6	228.6	333.0	0
39	695.7	178.2	313.3	262.5	235.3	337.0	0
40	675.3	184.4	323.3	269.2	241.6	338.8	0
41	663.8	189.7	327.5	275.7	247.5	340.9	0
42	655.4	195.6	327.4	282.2	253.4	342.8	0
43	654.5	201.1	325.1	288.0	258.9	345.5	0
44	655.6	206.3	321.7	292.7	263.7	348.0	0
45	656.9	211.1	318.0	296.4	268.2	350.1	0
46	656.1	215.5	314.4	299.3	271.9	351.4	0
47	654.0	219.5	311.0	301.4	275.2	352.2	0

Data from 12/20/22 testing - Reference only



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	653.3	223.4	308.1	302.8	277.9	353.1	0
49	654.9	227.0	305.5	304.1	280.0	354.3	0
50	657.8	230.3	303.2	304.8	281.9	355.6	0
51	661.5	233.5	301.2	305.3	283.3	357.0	0
52	665.0	236.3	299.5	305.5	284.6	358.2	0
53	667.2	238.9	298.1	305.5	285.8	359.1	0
54	669.7	241.3	297.0	305.4	287.0	360.1	0
55	674.0	243.5	296.1	305.2	288.2	361.4	0
56	679.9	245.1	295.1	304.9	289.3	362.9	0
57	688.0	246.9	294.3	304.4	290.4	364.8	0
58	696.2	247.9	293.8	303.1	290.9	366.4	0
59	705.7	248.8	293.2	302.1	291.8	368.3	0
60	712.6	249.7	293.1	301.1	293.0	369.9	0
61	718.2	250.7	293.3	300.0	294.3	371.3	0
62	723.8	251.7	293.8	299.3	296.0	372.9	0
63	738.4	252.9	294.4	298.6	298.0	376.5	0
64	759.7	254.3	295.7	298.1	300.2	381.6	0
65	783.4	255.7	297.6	297.9	302.7	387.4	0
66	805.5	257.1	300.1	297.7	305.3	393.2	0
67	823.1	258.8	303.1	298.0	308.3	398.3	0
68	839.0	260.6	305.5	298.4	311.7	403.2	0
69	853.3	262.5	311.3	299.0	315.3	408.1	0
70	866.4	264.7	314.3	299.9	319.2	412.9	0
71	878.0	266.9	318.6	301.0	323.4	417.6	0
72	887.0	269.4	323.2	302.4	328.0	422.0	0
73	894.3	272.1	328.3	304.0	332.7	426.3	0
74	898.6	274.9	333.5	305.6	337.6	430.0	0
75	901.4	277.6	338.9	307.7	342.7	433.7	0
76	903.2	280.5	344.4	309.8	348.0	437.2	0
77	904.2	283.5	350.0	312.5	353.4	440.7	0
78	903.9	286.6	355.7	315.3	359.3	444.2	0
79	902.5	290.0	361.3	318.3	365.0	447.4	0
80	898.7	293.4	366.8	321.6	370.7	450.3	0
81	892.1	297.1	372.1	325.4	376.7	452.7	0
82	883.4	301.4	377.3	329.7	382.7	454.9	0
83	874.6	305.6	382.6	333.8	388.5	457.0	0
84	866.0	309.6	387.6	337.7	394.1	459.0	0
85	857.8	313.7	392.5	341.4	399.3	460.9	0
86	851.7	317.5	397.2	344.9	404.1	463.1	0
87	847.4	321.4	401.9	348.3	408.5	465.5	0
88	845.6	325.2	406.6	351.3	412.5	468.2	0
89	845.5	328.9	411.4	354.4	416.3	471.3	0
90	845.9	332.4	416.2	357.1	419.8	474.3	0
91	843.7	335.9	421.0	359.9	423.0	476.7	0
92	838.9	339.4	425.7	362.8	426.0	478.6	0
93	832.1	342.8	430.2	365.2	428.8	479.8	0
94	824.7	346.2	434.5	367.7	431.4	480.9	0
95	817.1	349.5	438.4	370.0	433.7	481.7	0

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
96	810.8	352.5	442.1	372.1	435.9	482.7	0
97	804.8	355.7	445.5	374.2	437.9	483.6	0
98	799.9	358.2	449.3	375.7	439.3	484.5	0
99	797.9	361.8	453.2	378.1	440.6	486.3	0
100	798.6	365.2	457.0	380.1	442.2	488.6	0
101	799.5	368.4	460.3	382.2	443.4	490.8	0
102	798.8	371.5	463.4	384.3	444.2	492.4	0
103	798.1	374.6	466.2	386.4	445.1	494.1	0
104	796.7	377.4	468.8	388.3	445.8	495.4	0
105	794.2	380.0	471.2	390.3	446.0	496.3	0
106	790.1	382.5	473.2	392.1	446.2	496.8	0
107	783.2	384.7	474.9	393.8	446.1	496.5	0
108	773.1	386.7	476.2	395.6	446.0	495.5	0
109	760.4	388.5	477.2	397.1	445.6	493.8	0
110	748.2	390.2	477.6	398.6	445.0	491.9	0
111	738.8	391.9	477.8	399.9	444.8	490.7	0
112	729.2	393.9	477.7	401.3	444.5	489.3	0
113	721.0	395.7	477.2	402.1	444.0	488.0	0
114	714.7	396.5	476.2	403.2	442.5	486.6	0
115	709.8	397.2	475.0	403.9	440.5	485.3	0
116	706.2	398.0	473.7	404.5	438.9	484.2	0
117	703.1	399.1	472.4	404.9	437.4	483.4	0
118	699.8	400.3	471.1	405.1	435.7	482.4	0
119	695.9	401.2	469.7	405.2	433.9	481.2	0
120	690.3	402.2	468.4	405.1	432.1	479.6	0
Average	692.4	235.9	308.0	273.1	286.1	359	0

Data from 12/20/22 testing - Reference only

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 1

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

		Sample ID	Tare, mg		Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0116	188.4		191.5	3.1
	<b>B</b>	H0117	187.2		189.9	2.7
	<b>C - 1st Hour</b>	H0118	188.6		189.2	0.6
	<b>Amb</b>	H0146	90.8		90.8	0.0
<b>Probes</b>	<b>A</b>	11A	116864.8		116864.8	0.0
	<b>B</b>	11B	117338.7		117338.8	0.1
	<b>C - 1st Hour</b>	11C	116185.0		116185.7	0.7
<b>O-rings</b>	<b>A</b>	11A	3424.2		3424.3	0.1
	<b>B</b>	11B	4234.3		4234.5	0.2
	<b>C - 1st Hour</b>	11C	3589.3		3589.2	0.0*

\*Negative value corrected to zero

Placed in Dessicator on:

<b>Filters</b>	<b>A</b>	191.8	12/19 2:16	191.4	12/31 11:57	191.5	1/3 9:39		
	<b>B</b>	190.3	12/19 2:16	190.0	12/31 11:57	189.9	1/3 9:39		
	<b>C - 1st Hour</b>	189.3	12/19 2:16	189.2	12/31 11:58	189.2	1/3 9:40		
	<b>Amb</b>	91.2	12/19 2:16	90.8	12/31 12:12	90.8	1/3 9:40		
<b>Probes</b>	<b>A</b>			116865.0	12/31 12:11	116864.8	1/3 9:40		
	<b>B</b>			117339.0	12/31 12:12	117338.8	1/3 9:40		
	<b>C - 1st Hour</b>			116185.9	12/31 12:12	116185.7	1/3 9:40		
<b>O-Rings</b>	<b>A</b>			3424.3	12/31 11:57	3424.3	1/3 9:40		
	<b>B</b>			4234.5	12/31 11:57	4234.5	1/3 9:40		
	<b>C - 1st Hour</b>			3589.2	12/31 11:57	3589.2	1/3 9:40		

<b>Train A Aggregate, mg:</b>	<b>3.2</b>
<b>Train B Aggregate, mg:</b>	<b>3.0</b>
<b>Train C Aggregate, mg:</b>	<b>1.3</b>
<b>Ambient Aggregate, mg:</b>	<b>0.0</b>

**WOOD STOVE TEST DATA PACKET**  
**ASTM E3053/E2515**



**Run 2 Data Summary**

Client: SBI  
Model: J.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/19/2022

*Data from 12/20/22 testing - reference only*

  
\_\_\_\_\_  
Technician Signature

7/12/2023  
\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBIModel: 1.7RRun #: 2Job #: 22-835Tracking #: 135Technician: AKDate: 12/19/2022

<b>Burn Rate (kg/hr):</b>	<b>1.15</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	76.727	60.183	60.416	10.388
Average Gas Velocity in Dilution Tunnel (ft/sec)	23.54			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	27603.2			
Average Gas Meter Temperature (°F)	77.6	72.6	72.0	73.6
Total Sample Volume (dscf)	75.111	60.235	60.295	10.135
Average Tunnel Temperature (°F)	87.2			
Total Time of Test (min)	342			
Total Particulate Catch (mg)	0.2	3.2	3.4	3.2
Particulate Concentration, dry-standard (g/dscf)	0.0000027	0.0000531	0.0000564	0.0003157
Total PM Emissions (g)	0.42	7.94	8.45	8.64
Particulate Emission Rate (g/hr)	0.07	1.39	1.48	8.64
Emissions Factor (g/kg)	-	1.22	1.30	-
Difference from Average Total Particulate Emissions (g)	-	0.26	0.26	-
Difference from Average Total Particulate Emissions (%)	-	3.1%	3.1%	-
Difference from Average Emissions Factor (g/kg)	-	0.04	0.04	-

Final Average Results	
Total Particulate Emissions (g)	8.20
Particulate Emission Rate (g/hr)	1.44
Emissions Factor (g/kg)	1.26
HHV Efficiency (%)	75.1%
LHV Efficiency (%)	80.4%
CO Emissions (g/min)	0.56

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 80.3/Max: 89.6	OK
Face Velocity	< 30 ft/min	10.0	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:72.4/Max:90	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/19/22  
**Run:** 2  
**Control #:** 22-835  
**Test Duration:** 342  
**Output Category:** Low

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	75.1%	80.4%
<b>Combustion Efficiency</b>	98.1%	98.1%
<b>Heat Transfer Efficiency</b>	76.5%	82.0%

<b>Output Rate (kJ/h)</b>	16,184	15,353	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.15	2.53	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	21,563	20,455	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.54	14.41	<b>dry lb</b>
<b>MC wet (%)</b>	16.31		
<b>MC dry (%)</b>	19.49		
<b>Particulate (g)</b>	8.20		
<b>CO (g)</b>	192		
<b>Test Duration (h)</b>	5.70		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.09	2.08
<b>g/kg Dry Fuel</b>	1.25	29.36
<b>g/h</b>	1.44	33.68
<b>g/min</b>	0.02	0.56
<b>lb/MM Btu Output</b>	0.21	4.84

<b>Air/Fuel Ratio (A/F)</b>	15.14
-----------------------------	-------

VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/19/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.91  
 Max Allowable Start-up Fuel Weight (lbs): 4.36

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	15.75	3.17	In Range	29.0	21.5	18.3	22.9	In Range	2.58	1.17	
2	15.75	2.47	In Range	28.8	18.0	15.0	20.6	In Range	2.05	0.93	
3	16.00	2.88	In Range	25.5	17.9	16.6	20.0	In Range	2.40	1.09	
Core Load Wt. (lbs)		8.52	In Range								

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	16.00	3.64	In Range	26.8	16.7	17.2	20.2	In Range	3.03	1.37	
2	16.00	2.38	In Range	27.0	13.6	14.6	18.4	In Range	2.01	0.91	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.02	In Range								

Total Load Weight (lbs): 14.54 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: 101% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.1  
 Total Load Average Moisture Content (%DB): 20.5 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.0  
 Total Test Load Weight (dry basis): 12.06 lbs 5.47 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Avg.	Within Spec?	Dry Weight	
		1	2	3				lbs	kg
2.84	In Range	10	10	10	10.0	In Range	2.58	1.17	

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Avg.	Within Spec?	Dry Weight	
		1	2	3				lbs	kg
4.30	In Range	25.5	17.2	19.7	20.8	In Range	3.56	1.61	

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): Out of Range

## LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/19/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 12  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 17.28  
 Total Load Weight Range (lbs): 16.42 to 18.14  
 Core Load Weight Range (lbs): 7.78 to 11.23  
 Remainder Load Weight Range (lbs): 6.05 to 9.50  
 Core Load Piece Range (lbs): 2.59 to 4.32  
 Remainder Load Piece Range (lbs): 1.73 to 5.18

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	3.57	In Range	26.4	19.0	16.1	20.5	In Range	2.96	1.34
2	16.00	3.35	In Range	26.9	15.9	18.9	20.6	In Range	2.78	1.26
3	16.00	3.50	In Range	21.7	16.6	18.1	18.8	In Range	2.95	1.34
Core Load Wt. (lbs)		10.42	In Range							

### REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.25	4.21	In Range	25.1	17.6	11.3	18.0	In Range	3.57	1.62
2	15.75	2.72	In Range	25.8	16.7	17.7	20.1	In Range	2.27	1.03
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.93	In Range							

Remainder Load Small/Large Piece Weight Ratio: 65% In Range ≤ 67%  
 Total Load Weight (lbs): 17.35 In Range  
 Core Load % of Total Weight: 60% In Range 45-65%  
 Remainder % of Total Weight: 40% In Range 35-55%  
 Total Load % of Target Weight: 100% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 12.0  
 Total Load Average Moisture Content (%DB): 19.5 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.3  
 Total Test Load Weight (dry basis): 14.52 lbs 6.59 kg

### TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 1.8 to 3.4  
 Actual Charcoal Bed Wt. (lb): 2.91 In Range

### TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.13 Valid Test (≥90%)

Total Fuel Burned During Test Run:  
 17.2 lbs, wet basis  
 14.4 lbs, dry basis  
 6.53 kg, dry basis



## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2  
 Test Start Time: 14:14  
 Test Type: Low Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 342

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.49	29.59	29.54
Relative Humidity (%)	34.5	27.0	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	76.727 ft <sup>3</sup>		

**Sample Train Post-Test Leak Checks**

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

### DILUTION TUNNEL FLOW

**Traverse Data**

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.121	71
2	0.142	71
3	0.136	71
4	0.121	71
5	0.093	71
6	0.130	71
7	0.137	71
8	0.124	71
Center	0.141	71

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 23.68 ft/sec  
 V<sub>scnt</sub>: 25.15 ft/sec  
 F<sub>p</sub>: 0.942 [ratio]

Initial Tunnel Flow: 476.5 scf/min

Static Pressure: -0.293 in. H<sub>2</sub>O

### 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 2

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/19/2022

**Low Fire Performed as a continuation of High Fire Test, see Run 1 test data for details**

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.129	0.00	73.7	0.23		17.22		121.5	409.7	86.6	87.0
1			0.128	0.00	73.7	0.24	-	17.07	-0.14	120.2	383.0	86.3	89.6
2			0.127	0.00	73.7	0.23	-	16.85	-0.22	128.9	419.1	86.5	89.9
3			0.128	0.00	73.7	0.24	-	16.56	-0.29	124.8	497.8	86.7	89.1
4			0.129	0.00	73.7	0.23	-	16.37	-0.19	115.1	525.1	86.0	86.7
5			0.131	0.00	73.7	0.23	-	16.20	-0.17	113.8	545.2	85.6	85.4
6			0.129	0.00	73.7	0.24	-	16.04	-0.16	111.5	548.7	85.3	86.2
7			0.130	0.00	73.8	0.23	-	15.86	-0.17	111.9	556.2	85.2	85.8
8			0.131	0.00	73.8	0.24	-	15.68	-0.18	107.8	562.9	84.8	87.9
9			0.130	0.00	73.9	0.22	-	15.50	-0.18	105.3	555.1	84.4	89.5
10	1.771	0.177	0.131	0.00	73.9	0.24	105	15.33	-0.17	105.5	545.4	84.0	89.9
11			0.131	0.00	73.9	0.25	-	15.17	-0.16	108.4	539.1	84.1	88.3
12			0.130	0.00	73.9	0.23	-	15.04	-0.13	108.8	534.4	84.1	87.7
13			0.130	0.00	73.8	0.25	-	14.89	-0.15	112.8	529.4	84.1	87.3
14			0.131	0.00	73.8	0.24	-	14.74	-0.15	112.0	537.2	84.3	84.0
15			0.130	0.00	73.8	0.25	-	14.56	-0.17	110.6	544.6	84.1	84.4
16			0.130	0.00	73.8	0.24	-	14.48	-0.08	107.6	522.0	83.6	87.4
17			0.132	0.00	73.8	0.23	-	14.34	-0.14	103.3	500.8	83.2	87.6
18			0.133	0.00	73.7	0.23	-	14.23	-0.10	100.2	483.3	82.7	89.8
19			0.132	0.00	73.7	0.22	-	14.12	-0.12	100.9	465.6	82.4	89.8
20	3.501	0.173	0.132	0.00	73.6	0.22	101	14.01	-0.10	102.6	449.3	82.1	89.6
21			0.131	0.00	73.6	0.22	-	13.94	-0.07	103.4	434.1	81.8	87.9
22			0.132	0.00	73.5	0.21	-	13.86	-0.08	102.9	421.0	81.5	87.6
23			0.134	0.00	73.6	0.21	-	13.80	-0.07	102.3	410.4	81.6	86.8
24			0.133	0.00	73.5	0.22	-	13.72	-0.08	101.7	401.3	82.4	86.8
25			0.133	0.00	73.5	0.22	-	13.67	-0.05	97.9	389.8	83.0	88.3
26			0.134	0.00	73.5	0.21	-	13.59	-0.08	95.2	377.7	83.3	90.0
27			0.134	0.00	73.5	0.23	-	13.48	-0.10	97.0	372.1	83.9	89.6
28			0.134	0.00	73.4	0.23	-	13.39	-0.09	99.2	371.6	84.5	88.7
29			0.134	0.00	73.5	0.25	-	13.30	-0.09	100.3	382.2	85.1	87.3
30	5.210	0.171	0.133	0.00	73.5	0.25	99	13.22	-0.08	100.3	392.7	85.5	86.2
31			0.134	0.00	73.4	0.26	-	13.12	-0.10	100.4	400.1	86.0	86.4
32			0.134	0.00	73.4	0.27	-	13.03	-0.09	100.4	408.6	86.5	86.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.134	0.00	73.4	0.25	-	12.93	-0.10	100.5	415.7	86.9	85.9
34			0.132	0.00	73.4	0.26	-	12.82	-0.11	100.6	421.9	87.0	86.0
35			0.133	0.00	73.3	0.26	-	12.71	-0.11	100.6	427.7	86.7	85.6
36			0.133	0.00	73.3	0.27	-	12.61	-0.10	101.0	433.1	86.5	86.1
37			0.133	0.00	73.3	0.25	-	12.50	-0.10	101.6	438.5	86.1	84.7
38			0.133	0.00	73.3	0.26	-	12.41	-0.09	101.2	442.5	85.8	83.4
39			0.133	0.00	73.3	0.26	-	12.33	-0.08	100.8	444.8	85.6	83.6
40	6.938	0.173	0.133	0.00	73.4	0.27	100	12.22	-0.11	100.3	448.0	85.2	81.4
41			0.134	0.00	73.4	0.27	-	12.12	-0.10	98.6	449.7	84.8	81.1
42			0.134	0.00	73.4	0.27	-	12.01	-0.11	97.6	451.7	84.6	81.9
43			0.134	0.00	73.5	0.25	-	11.91	-0.11	97.2	452.8	84.4	81.9
44			0.134	0.00	73.5	0.25	-	11.77	-0.13	96.9	454.1	84.1	81.7
45			0.135	0.00	73.6	0.25	-	11.67	-0.11	96.7	455.3	83.8	81.5
46			0.135	0.00	73.5	0.25	-	11.53	-0.14	96.6	457.5	83.6	81.1
47			0.134	0.00	73.5	0.26	-	11.39	-0.14	96.4	459.3	83.6	81.6
48			0.134	0.00	73.5	0.26	-	11.26	-0.13	96.4	461.1	83.4	80.7
49			0.134	0.00	73.5	0.25	-	11.13	-0.13	96.2	462.8	83.3	80.7
50	8.661	0.172	0.135	0.00	73.5	0.25	99	10.97	-0.15	96.1	464.8	83.2	80.9
51			0.134	0.00	73.6	0.25	-	10.84	-0.13	96.4	465.7	82.9	80.8
52			0.135	0.00	73.6	0.25	-	10.73	-0.11	96.0	464.8	82.8	79.6
53			0.134	0.00	73.5	0.25	-	10.57	-0.15	96.1	466.1	82.8	80.1
54			0.134	0.00	73.5	0.26	-	10.43	-0.14	96.0	466.1	82.7	80.4
55			0.135	0.00	73.5	0.26	-	10.29	-0.14	95.9	465.6	82.5	80.1
56			0.135	0.00	73.5	0.26	-	10.17	-0.13	95.8	465.0	82.4	79.4
57			0.135	0.00	73.5	0.26	-	10.03	-0.14	95.7	462.8	82.3	79.5
58			0.133	0.00	73.6	0.25	-	9.89	-0.14	95.6	462.4	82.2	80.5
59			0.134	0.00	73.6	0.26	-	9.77	-0.13	95.4	462.3	82.2	80.7
60	10.388	0.173	0.133	0.00	73.6	0.26	99	9.63	-0.14	95.4	461.0	82.2	80.0
61			0.134	0.00	73.6	0.25	-	9.53	-0.10	95.4	459.4	82.2	79.7
62			0.136	0.00	73.5	0.26	-	9.37	-0.15	95.3	457.5	82.1	79.1
63			0.134	0.00	73.5	0.25	-	9.20	-0.17	95.2	454.7	82.1	78.1
64			0.134	0.00	73.5	0.25	-	9.05	-0.15	94.8	453.8	82.0	76.1
65			0.135	0.00	73.5	0.26	-	8.91	-0.15	94.9	454.1	82.0	76.4

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.132	0.00	73.5	0.25	-	8.76	-0.14	94.8	455.0	82.1	76.1
67			0.135	0.00	73.4	0.25	-	8.60	-0.16	94.7	454.9	82.9	75.5
68			0.135	0.00	73.5	0.26	-	8.45	-0.15	94.6	455.6	83.9	75.1
69			0.134	0.00	73.5	0.26	-	8.31	-0.14	94.6	455.9	84.8	74.8
70	12.101	0.171	0.136	0.00	73.4	0.26	98	8.17	-0.14	94.5	455.5	85.6	74.8
71			0.135	0.00	73.4	0.27	-	8.03	-0.14	94.5	456.0	86.3	74.3
72			0.134	0.00	73.4	0.26	-	7.88	-0.15	94.5	456.1	86.2	74.2
73			0.135	0.00	73.5	0.27	-	7.75	-0.13	94.3	456.2	85.7	74.0
74			0.135	0.00	73.4	0.26	-	7.61	-0.14	94.2	456.1	85.1	73.8
75			0.135	0.00	73.4	0.27	-	7.47	-0.14	94.2	457.0	84.8	73.5
76			0.134	0.00	73.4	0.27	-	7.33	-0.14	94.3	459.4	84.4	73.3
77			0.135	0.00	73.4	0.28	-	7.20	-0.13	94.1	460.3	84.1	73.2
78			0.135	0.00	73.4	0.28	-	7.06	-0.14	94.1	462.5	83.8	73.3
79			0.136	0.00	73.4	0.27	-	6.94	-0.12	94.2	464.9	83.5	72.9
80	13.818	0.172	0.135	0.00	73.4	0.28	98	6.80	-0.15	94.2	467.6	83.3	73.2
81			0.135	0.00	73.3	0.29	-	6.66	-0.14	94.5	468.2	83.0	73.2
82			0.136	0.00	73.3	0.30	-	6.51	-0.15	94.2	469.1	82.9	72.9
83			0.135	0.00	73.4	0.30	-	6.40	-0.11	94.4	471.5	82.7	73.0
84			0.135	0.00	73.4	0.32	-	6.26	-0.14	94.4	473.4	82.5	73.2
85			0.135	0.00	73.3	0.33	-	6.13	-0.13	94.5	475.9	82.2	73.2
86			0.134	0.00	73.3	0.34	-	5.99	-0.13	94.6	477.6	82.0	73.0
87			0.134	0.00	73.4	0.40	-	5.86	-0.13	94.7	479.8	81.9	72.7
88			0.135	0.00	73.4	0.45	-	5.72	-0.14	94.7	481.1	82.5	72.6
89			0.134	0.00	73.5	0.50	-	5.58	-0.14	95.0	481.5	83.3	72.6
90	15.515	0.170	0.134	0.00	73.3	0.53	97	5.46	-0.12	94.9	481.2	83.9	72.6
91			0.134	0.00	73.4	0.59	-	5.33	-0.13	94.7	479.3	84.6	73.2
92			0.134	0.00	73.4	0.59	-	5.21	-0.12	94.7	476.9	85.3	73.3
93			0.135	0.00	73.5	0.59	-	5.11	-0.10	94.4	471.3	85.7	73.3
94			0.133	0.00	73.5	0.60	-	4.98	-0.13	94.3	467.4	86.2	73.2
95			0.135	0.00	73.5	0.62	-	4.89	-0.10	94.2	464.6	86.6	73.3
96			0.135	0.00	73.5	0.65	-	4.79	-0.10	93.9	461.4	86.9	72.4
97			0.134	0.00	73.4	0.65	-	4.68	-0.11	94.0	458.8	87.2	72.9
98			0.134	0.00	73.4	0.66	-	4.58	-0.10	93.6	456.3	87.1	74.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.135	0.00	73.4	0.65	-	4.48	-0.09	93.9	457.6	86.4	75.7
100	17.229	0.171	0.134	0.00	73.4	0.65	98	4.42	-0.06	94.0	457.8	86.0	76.1
101			0.133	0.00	73.4	0.66	-	4.32	-0.10	94.0	457.2	85.4	76.6
102			0.135	0.00	73.5	0.68	-	4.26	-0.06	93.9	456.4	85.1	76.8
103			0.134	0.00	73.5	0.69	-	4.20	-0.06	93.9	456.1	84.8	77.5
104			0.133	0.00	73.5	0.69	-	4.13	-0.07	93.7	449.2	84.7	77.8
105			0.134	0.00	73.4	0.68	-	4.09	-0.04	93.4	441.7	84.4	78.1
106			0.135	0.00	73.4	0.69	-	4.03	-0.06	93.2	436.4	84.2	77.9
107			0.134	0.00	73.4	0.69	-	3.98	-0.05	92.7	432.8	83.9	78.0
108			0.135	0.00	73.4	0.68	-	3.94	-0.04	92.7	428.2	83.8	78.4
109			0.134	0.00	73.4	0.69	-	3.88	-0.06	92.4	422.1	83.6	78.4
110	18.965	0.174	0.135	0.00	73.4	0.68	99	3.85	-0.03	92.0	414.7	83.5	78.8
111			0.134	0.00	73.4	0.70	-	3.81	-0.04	91.6	407.7	83.3	78.1
112			0.134	0.00	73.4	0.69	-	3.78	-0.03	91.4	401.6	83.2	78.7
113			0.134	0.00	73.4	0.68	-	3.73	-0.04	91.0	395.3	83.1	79.4
114			0.134	0.00	73.5	0.68	-	3.71	-0.03	90.8	390.8	82.8	78.6
115			0.135	0.00	73.5	0.68	-	3.66	-0.05	90.6	386.4	82.7	79.5
116			0.136	0.00	73.5	0.68	-	3.61	-0.05	90.4	382.6	82.5	79.2
117			0.133	0.00	73.5	0.69	-	3.58	-0.03	90.3	379.6	82.3	79.2
118			0.135	0.00	73.4	0.68	-	3.54	-0.04	89.9	376.6	82.2	78.8
119			0.136	0.00	73.4	0.68	-	3.50	-0.04	89.8	374.6	81.9	79.1
120	20.729	0.176	0.135	0.00	73.3	0.68	101	3.47	-0.03	89.7	372.9	81.8	78.9
121			0.135	0.00	73.3	0.67	-	3.43	-0.05	89.6	371.5	81.6	79.3
122			0.135	0.00	73.2	0.67	-	3.37	-0.05	89.4	370.1	81.4	79.4
123			0.135	0.00	73.3	0.68	-	3.35	-0.02	89.3	368.0	81.1	79.1
124			0.135	0.00	73.3	0.68	-	3.32	-0.03	89.2	366.2	80.9	79.3
125			0.136	0.00	73.3	0.69	-	3.28	-0.04	89.0	364.2	81.5	79.2
126			0.135	0.00	73.3	0.68	-	3.25	-0.03	88.8	362.2	82.3	79.6
127			0.134	0.00	73.2	0.69	-	3.20	-0.04	88.8	360.2	83.2	79.3
128			0.135	0.00	73.2	0.68	-	3.18	-0.03	88.5	358.5	83.9	79.7
129			0.136	0.00	73.2	0.68	-	3.14	-0.03	88.4	357.1	84.4	79.5
130	22.491	0.176	0.135	0.00	73.2	0.68	100	3.10	-0.04	88.2	355.6	84.8	79.4
131			0.134	0.00	73.2	0.69	-	3.08	-0.02	88.2	353.5	85.2	79.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132			0.135	0.00	73.1	0.69	-	3.04	-0.04	87.9	350.5	85.6	79.5
133			0.134	0.00	73.1	0.69	-	3.02	-0.03	87.7	346.9	86.0	79.6
134			0.134	0.00	73.1	0.69	-	2.99	-0.03	87.5	343.9	86.4	79.1
135			0.135	0.00	73.0	0.69	-	2.96	-0.02	87.4	340.8	86.7	79.0
136			0.134	0.00	73.1	0.69	-	2.94	-0.02	87.1	338.0	87.1	79.1
137			0.136	0.00	73.1	0.70	-	2.92	-0.02	87.0	335.6	87.2	79.4
138			0.135	0.00	73.2	0.69	-	2.90	-0.02	86.9	333.2	87.4	79.2
139			0.135	0.00	73.1	0.68	-	2.88	-0.02	86.8	331.4	86.5	79.0
140	24.246	0.176	0.134	0.00	73.1	0.69	100	2.85	-0.03	86.6	329.5	85.5	79.3
141			0.134	0.00	73.0	0.68	-	2.83	-0.02	86.5	328.0	84.7	79.3
142			0.134	0.00	73.0	0.68	-	2.81	-0.02	86.4	326.4	84.1	79.0
143			0.134	0.00	73.1	0.68	-	2.78	-0.03	86.2	324.3	83.3	79.3
144			0.134	0.00	73.0	0.67	-	2.74	-0.04	86.1	322.8	82.8	79.3
145			0.135	0.00	73.0	0.68	-	2.73	-0.01	85.9	321.5	82.3	79.6
146			0.136	0.00	73.0	0.66	-	2.71	-0.02	85.7	320.0	81.8	78.8
147			0.135	0.00	73.0	0.67	-	2.68	-0.03	85.7	318.3	81.3	79.1
148			0.136	0.00	72.9	0.66	-	2.65	-0.04	85.6	316.6	81.0	78.7
149			0.135	0.00	72.9	0.67	-	2.63	-0.02	85.5	314.9	80.5	78.8
150	26.004	0.176	0.136	0.00	73.0	0.67	100	2.61	-0.01	85.3	312.9	81.2	78.5
151			0.135	0.00	72.9	0.68	-	2.59	-0.02	85.3	311.6	82.1	78.8
152			0.135	0.00	73.0	0.68	-	2.58	-0.02	85.2	310.1	82.8	78.6
153			0.137	0.00	72.9	0.69	-	2.55	-0.02	85.1	308.8	83.4	78.9
154			0.135	0.00	72.9	0.67	-	2.52	-0.03	85.1	306.7	84.2	78.2
155			0.135	0.00	73.0	0.68	-	2.50	-0.02	84.9	305.1	84.6	79.1
156			0.134	0.00	73.0	0.67	-	2.49	-0.02	84.8	303.8	85.1	78.9
157			0.135	0.00	73.0	0.67	-	2.46	-0.02	84.7	302.9	85.6	78.8
158			0.135	0.00	73.1	0.67	-	2.45	-0.01	84.7	301.8	86.0	78.2
159			0.136	0.00	73.1	0.66	-	2.43	-0.01	84.5	300.7	86.2	78.8
160	27.765	0.176	0.136	0.00	73.0	0.67	100	2.41	-0.03	84.5	299.8	86.5	78.8
161			0.136	0.00	72.9	0.68	-	2.38	-0.03	84.4	299.2	86.8	78.7
162			0.137	0.00	72.9	0.67	-	2.34	-0.04	84.3	298.7	86.5	78.3
163			0.136	0.00	72.8	0.68	-	2.32	-0.02	84.2	298.4	85.7	78.3
164			0.135	0.00	72.7	0.67	-	2.30	-0.03	84.1	298.3	85.2	78.4

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165			0.137	0.00	72.6	0.67	-	2.27	-0.03	84.1	297.8	84.8	78.1
166			0.137	0.00	72.6	0.67	-	2.25	-0.02	84.0	296.1	84.4	78.2
167			0.136	0.00	72.6	0.67	-	2.23	-0.02	83.9	294.4	84.1	78.1
168			0.137	0.00	72.6	0.67	-	2.22	-0.01	83.8	293.2	83.7	78.3
169			0.136	0.00	72.7	0.68	-	2.20	-0.02	83.7	292.1	83.4	77.6
170	29.523	0.176	0.136	0.00	72.6	0.67	99	2.17	-0.02	83.7	291.1	83.2	78.1
171			0.136	0.00	72.7	0.68	-	2.15	-0.02	83.7	290.5	83.0	78.2
172			0.136	0.00	72.7	0.68	-	2.12	-0.03	83.5	288.9	82.7	77.8
173			0.136	0.00	72.6	0.68	-	2.10	-0.02	83.6	288.1	82.6	78.0
174			0.136	0.00	72.5	0.68	-	2.08	-0.02	83.4	287.0	82.5	77.3
175			0.136	0.00	72.5	0.67	-	2.05	-0.03	83.3	286.1	82.4	77.1
176			0.137	0.00	72.4	0.67	-	2.04	-0.01	83.2	285.4	82.2	77.1
177			0.137	0.00	72.5	0.67	-	2.02	-0.02	83.2	285.1	82.0	77.7
178			0.137	0.00	72.6	0.68	-	2.00	-0.02	83.2	283.8	82.1	78.0
179			0.136	0.00	72.7	0.68	-	1.98	-0.02	83.1	283.1	82.8	78.0
180	31.303	0.178	0.135	0.00	72.6	0.67	101	1.96	-0.02	83.0	282.2	83.5	77.9
181			0.136	0.00	72.6	0.68	-	1.95	-0.02	83.0	281.5	84.1	78.2
182			0.137	0.00	72.7	0.69	-	1.93	-0.02	82.9	281.1	84.6	77.6
183			0.137	0.00	72.7	0.68	-	1.91	-0.02	82.8	280.0	84.9	77.8
184			0.136	0.00	72.6	0.68	-	1.89	-0.02	82.9	278.8	85.4	77.6
185			0.137	0.00	72.6	0.67	-	1.87	-0.02	83.0	278.2	85.7	78.0
186			0.136	0.00	72.6	0.69	-	1.86	-0.01	82.8	277.0	86.0	78.3
187			0.137	0.00	72.6	0.69	-	1.84	-0.02	82.7	276.3	85.8	77.4
188			0.138	0.00	72.6	0.68	-	1.81	-0.03	82.6	275.8	85.0	77.1
189			0.137	0.00	72.7	0.69	-	1.78	-0.03	82.7	275.0	84.4	77.5
190	33.078	0.178	0.136	0.00	72.6	0.68	100	1.76	-0.01	82.5	274.6	83.7	76.3
191			0.137	0.00	72.6	0.68	-	1.73	-0.03	82.4	274.0	83.3	77.1
192			0.137	0.00	72.6	0.68	-	1.72	-0.01	82.4	273.2	82.9	77.7
193			0.136	0.00	72.5	0.68	-	1.71	-0.02	82.3	272.8	82.5	77.4
194			0.137	0.00	72.5	0.68	-	1.69	-0.02	82.3	271.9	82.2	77.6
195			0.137	0.00	72.4	0.68	-	1.67	-0.02	82.2	271.7	81.8	77.5
196			0.137	0.00	72.4	0.67	-	1.65	-0.02	82.1	271.3	81.6	76.5
197			0.137	0.00	72.4	0.67	-	1.63	-0.03	82.1	270.9	81.5	76.5



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198			0.137	0.00	72.5	0.66	-	1.61	-0.02	82.0	270.1	81.2	76.7
199			0.136	0.00	72.5	0.68	-	1.59	-0.02	82.1	269.5	81.4	76.7
200	34.858	0.178	0.136	0.00	72.5	0.67	101	1.56	-0.03	82.0	268.6	82.0	76.3
201			0.137	0.00	72.4	0.68	-	1.55	-0.01	82.0	268.3	82.7	75.9
202			0.136	0.00	72.4	0.68	-	1.53	-0.02	81.9	268.0	83.1	75.7
203			0.136	0.00	72.3	0.68	-	1.50	-0.02	81.8	267.1	83.6	76.5
204			0.136	0.00	72.2	0.67	-	1.49	-0.01	81.8	265.8	84.0	76.8
205			0.137	0.00	72.2	0.67	-	1.48	-0.01	81.6	264.9	84.2	76.5
206			0.136	0.00	72.1	0.68	-	1.46	-0.02	81.5	264.5	84.6	75.9
207			0.136	0.00	72.1	0.67	-	1.44	-0.02	81.6	264.2	85.2	75.8
208			0.137	0.00	72.1	0.67	-	1.42	-0.02	81.6	263.7	85.4	75.8
209			0.136	0.00	72.2	0.68	-	1.40	-0.02	81.5	263.5	85.5	76.0
210	36.637	0.178	0.138	0.00	72.1	0.67	100	1.38	-0.02	81.5	262.8	85.7	76.1
211			0.136	0.00	72.1	0.70	-	1.37	0.00	81.4	262.3	86.0	75.7
212			0.138	0.00	72.2	0.68	-	1.35	-0.02	81.4	261.7	86.2	76.1
213			0.136	0.00	72.1	0.68	-	1.34	-0.02	81.3	261.1	86.4	75.4
214			0.136	0.00	72.1	0.69	-	1.32	-0.02	81.4	260.5	86.6	76.1
215			0.136	0.00	72.0	0.69	-	1.30	-0.01	81.2	259.5	86.7	76.3
216			0.137	0.00	72.0	0.69	-	1.28	-0.02	81.2	259.3	86.9	76.0
217			0.136	0.00	72.0	0.68	-	1.26	-0.01	81.2	258.6	86.8	76.1
218			0.136	0.00	72.0	0.68	-	1.25	-0.01	81.1	258.2	86.2	76.4
219			0.135	0.00	72.0	0.70	-	1.24	-0.01	81.1	257.6	85.7	76.0
220	38.417	0.178	0.136	0.00	72.0	0.69	100	1.21	-0.02	81.1	257.0	85.2	75.8
221			0.136	0.00	72.0	0.70	-	1.19	-0.02	81.0	256.6	84.9	76.3
222			0.136	0.00	72.0	0.69	-	1.19	0.00	81.0	256.1	84.6	76.7
223			0.137	0.00	71.9	0.69	-	1.18	-0.02	80.9	255.5	84.3	76.0
224			0.137	0.00	72.0	0.69	-	1.15	-0.03	80.9	255.2	84.1	76.3
225			0.136	0.00	72.0	0.69	-	1.15	-0.01	80.9	254.4	83.7	76.4
226			0.138	0.00	72.0	0.69	-	1.13	-0.02	80.7	253.6	83.5	76.4
227			0.135	0.00	72.1	0.69	-	1.10	-0.03	80.8	253.0	83.3	76.5
228			0.136	0.00	72.0	0.68	-	1.10	0.00	80.6	252.1	83.1	76.1
229			0.135	0.00	72.0	0.68	-	1.08	-0.02	80.6	251.1	83.0	76.4
230	40.196	0.178	0.136	0.00	72.1	0.69	100	1.08	-0.01	80.7	250.3	83.2	75.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231			0.137	0.00	72.1	0.69	-	1.05	-0.03	80.6	249.3	83.3	76.3
232			0.136	0.00	72.1	0.68	-	1.04	-0.01	80.4	248.6	83.4	76.0
233			0.137	0.00	72.1	0.68	-	1.04	-0.01	80.5	248.0	83.5	76.2
234			0.136	0.00	72.0	0.69	-	1.02	-0.02	80.3	246.8	83.7	75.3
235			0.136	0.00	72.0	0.69	-	1.01	-0.01	80.4	246.2	83.8	76.0
236			0.137	0.00	72.0	0.68	-	0.99	-0.01	80.3	245.5	83.9	75.7
237			0.138	0.00	72.0	0.68	-	0.98	-0.02	80.3	244.4	84.0	76.1
238			0.137	0.00	71.9	0.69	-	0.97	-0.01	80.2	243.8	84.1	75.7
239			0.136	0.00	72.0	0.68	-	0.96	-0.01	80.1	243.1	84.1	76.0
240	41.978	0.178	0.137	0.00	72.0	0.70	100	0.94	-0.02	80.2	242.1	84.1	76.0
241			0.137	0.00	71.9	0.68	-	0.93	0.00	80.1	241.9	84.1	76.2
242			0.136	0.00	71.9	0.68	-	0.91	-0.02	80.0	241.0	84.2	76.2
243			0.136	0.00	71.9	0.70	-	0.90	-0.01	80.0	240.1	84.3	76.1
244			0.138	0.00	71.8	0.68	-	0.88	-0.02	80.0	239.2	84.3	75.9
245			0.137	0.00	71.8	0.68	-	0.89	0.00	79.9	238.9	84.3	75.9
246			0.136	0.00	71.8	0.68	-	0.85	-0.03	79.8	238.0	84.4	75.5
247			0.137	0.00	71.7	0.69	-	0.84	-0.02	79.7	237.3	84.5	75.1
248			0.137	0.00	71.7	0.67	-	0.83	0.00	79.7	236.6	84.6	74.8
249			0.135	0.00	71.8	0.67	-	0.82	-0.01	79.9	236.1	84.6	74.7
250	43.757	0.178	0.137	0.00	71.7	0.67	100	0.80	-0.02	79.7	235.3	84.6	75.1
251			0.136	0.00	71.7	0.68	-	0.78	-0.01	79.7	234.6	84.7	75.1
252			0.136	0.00	71.6	0.69	-	0.77	-0.02	79.6	234.0	84.8	75.5
253			0.138	0.00	71.7	0.68	-	0.76	0.00	79.6	233.2	84.8	74.8
254			0.138	0.00	71.7	0.67	-	0.75	-0.01	79.5	232.8	84.8	74.5
255			0.138	0.00	71.6	0.68	-	0.73	-0.02	79.5	231.9	84.8	74.9
256			0.137	0.00	71.6	0.68	-	0.72	-0.01	79.5	231.6	84.8	74.5
257			0.138	0.00	71.7	0.67	-	0.70	-0.02	79.4	231.1	84.8	74.7
258			0.136	0.00	71.7	0.68	-	0.69	-0.01	79.4	230.4	84.9	75.2
259			0.138	0.00	71.7	0.69	-	0.68	-0.02	79.4	229.6	84.8	74.5
260	45.535	0.178	0.137	0.00	71.7	0.69	100	0.66	-0.02	79.4	228.7	84.7	74.7
261			0.137	0.00	71.7	0.68	-	0.65	-0.01	79.3	228.2	84.6	75.2
262			0.138	0.00	71.8	0.68	-	0.63	-0.02	79.3	227.7	84.5	75.3
263			0.137	0.00	71.8	0.68	-	0.63	0.00	79.2	227.1	84.4	74.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264			0.137	0.00	71.8	0.69	-	0.61	-0.02	79.2	226.4	84.3	75.2
265			0.136	0.00	71.7	0.69	-	0.60	-0.02	79.1	225.6	84.4	74.8
266			0.137	0.00	71.6	0.68	-	0.60	0.00	79.1	225.4	84.3	75.1
267			0.136	0.00	71.6	0.68	-	0.57	-0.03	79.0	224.6	84.4	74.5
268			0.136	0.00	71.5	0.69	-	0.56	-0.01	79.1	224.2	84.4	74.6
269			0.136	0.00	71.5	0.68	-	0.55	-0.01	79.1	223.8	84.3	74.8
270	47.324	0.179	0.137	0.00	71.5	0.68	100	0.54	-0.01	79.0	223.1	84.3	74.8
271			0.137	0.00	71.5	0.68	-	0.52	-0.01	78.9	222.7	84.3	75.0
272			0.137	0.00	71.5	0.68	-	0.51	-0.01	79.0	222.3	84.3	75.0
273			0.137	0.00	71.4	0.68	-	0.50	-0.01	78.9	222.1	84.2	75.0
274			0.137	0.00	71.4	0.68	-	0.49	-0.01	78.9	221.5	84.1	74.5
275			0.137	0.00	71.4	0.67	-	0.48	-0.01	78.9	221.0	84.2	75.2
276			0.137	0.00	71.5	0.68	-	0.46	-0.02	78.8	220.6	84.2	74.8
277			0.138	0.00	71.4	0.68	-	0.44	-0.01	78.8	220.2	84.1	75.2
278			0.137	0.00	71.4	0.69	-	0.43	-0.01	78.7	219.7	84.1	75.0
279			0.137	0.00	71.4	0.68	-	0.42	-0.01	78.7	219.3	84.1	74.9
280	49.101	0.178	0.136	0.00	71.5	0.69	100	0.41	-0.01	78.6	218.7	84.0	75.2
281			0.138	0.00	71.4	0.69	-	0.42	0.00	78.7	218.5	84.2	74.8
282			0.137	0.00	71.4	0.68	-	0.39	-0.03	78.5	217.5	84.1	75.1
283			0.136	0.00	71.4	0.69	-	0.38	-0.01	78.5	217.2	84.0	75.3
284			0.137	0.00	71.3	0.69	-	0.37	-0.02	78.4	216.6	84.0	73.8
285			0.138	0.00	71.3	0.67	-	0.36	-0.01	78.5	216.4	83.9	74.5
286			0.138	0.00	71.4	0.67	-	0.36	0.00	78.4	215.9	83.9	74.1
287			0.136	0.00	71.5	0.68	-	0.34	-0.02	78.4	215.2	83.9	74.1
288			0.137	0.00	71.4	0.68	-	0.32	-0.02	82.0	222.7	84.2	74.6
289			0.137	0.00	71.5	0.67	-	0.31	-0.01	79.3	217.9	84.0	74.6
290	50.883	0.178	0.136	0.00	71.6	0.69	100	0.30	-0.01	78.8	214.9	83.9	74.2
291			0.138	0.00	71.5	0.68	-	0.29	-0.01	78.5	212.9	83.9	74.4
292			0.136	0.00	71.5	0.67	-	0.28	-0.01	78.4	211.2	83.9	74.4
293			0.138	0.00	71.5	0.68	-	0.27	0.00	78.3	209.5	83.9	74.3
294			0.137	0.00	71.5	0.68	-	0.27	0.00	78.3	208.1	83.9	74.6
295			0.138	0.00	71.5	0.68	-	0.26	-0.01	78.2	206.8	83.8	74.2
296			0.137	0.00	71.4	0.68	-	0.25	-0.01	78.2	205.8	83.8	74.5

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297			0.136	0.00	71.4	0.69	-	0.24	-0.01	78.1	204.7	83.8	74.4
298			0.138	0.00	71.4	0.68	-	0.25	0.01	78.1	203.6	83.8	74.0
299			0.137	0.00	71.5	0.68	-	0.24	-0.01	78.0	202.7	83.8	74.1
300	52.663	0.178	0.137	0.00	71.5	0.68	100	0.23	-0.01	77.9	201.6	83.7	74.3
301			0.136	0.00	71.5	0.69	-	0.22	-0.01	78.0	200.6	83.8	74.7
302			0.137	0.00	71.4	0.69	-	0.22	0.00	77.8	199.4	83.8	74.5
303			0.136	0.00	71.5	0.69	-	0.22	0.00	77.9	198.6	83.8	74.8
304			0.137	0.00	71.4	0.69	-	0.21	0.00	77.7	197.4	83.7	74.3
305			0.138	0.00	71.5	0.68	-	0.20	-0.01	77.8	196.4	83.8	74.3
306			0.137	0.00	71.5	0.69	-	0.19	-0.02	77.7	195.8	83.7	74.2
307			0.136	0.00	71.5	0.68	-	0.20	0.01	77.7	194.7	83.8	74.3
308			0.136	0.00	71.6	0.69	-	0.18	-0.02	77.6	193.9	83.8	73.9
309			0.137	0.00	71.7	0.69	-	0.16	-0.01	77.6	192.9	83.7	73.9
310	54.452	0.179	0.137	0.00	71.7	0.68	100	0.16	0.00	77.5	192.3	83.5	74.1
311			0.137	0.00	71.5	0.68	-	0.16	-0.01	77.5	191.6	83.6	74.1
312			0.138	0.00	71.6	0.68	-	0.15	0.00	77.4	190.6	83.4	74.1
313			0.137	0.00	71.6	0.70	-	0.15	0.00	77.4	189.9	83.5	73.8
314			0.137	0.00	71.5	0.69	-	0.15	-0.01	77.4	189.0	83.3	73.9
315			0.138	0.00	71.6	0.68	-	0.14	0.00	77.2	188.4	83.2	74.0
316			0.137	0.00	71.6	0.68	-	0.14	-0.01	77.3	187.5	83.3	74.2
317			0.137	0.00	71.6	0.69	-	0.11	-0.02	77.2	186.9	83.2	73.8
318			0.138	0.00	71.5	0.68	-	0.13	0.01	77.1	186.2	83.2	73.9
319			0.137	0.00	71.5	0.69	-	0.11	-0.01	77.0	185.5	83.3	73.7
320	56.240	0.179	0.138	0.00	71.6	0.69	100	0.11	0.00	77.2	184.7	83.2	73.7
321			0.138	0.00	71.5	0.70	-	0.10	-0.01	77.0	183.9	83.1	73.7
322			0.137	0.00	71.5	0.69	-	0.09	-0.01	77.0	183.3	83.2	73.6
323			0.137	0.00	71.5	0.69	-	0.09	-0.01	77.0	182.3	83.2	73.7
324			0.136	0.00	71.5	0.69	-	0.08	-0.01	76.9	181.7	83.2	73.8
325			0.137	0.00	71.5	0.69	-	0.08	0.00	77.0	181.0	83.3	73.6
326			0.137	0.00	71.6	0.68	-	0.08	-0.01	76.8	180.4	83.2	73.8
327			0.137	0.00	71.6	0.69	-	0.08	0.00	76.9	179.7	83.3	73.7
328			0.137	0.00	71.6	0.70	-	0.07	-0.01	76.7	179.0	83.3	73.6
329			0.137	0.00	71.6	0.70	-	0.06	-0.01	76.8	178.3	83.3	73.8

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	58.027	0.179	0.137	0.00	71.6	0.70	100	0.06	0.00	76.7	177.7	83.2	73.5
331			0.138	0.00	71.7	0.68	-	0.05	-0.01	76.7	177.0	83.3	73.6
332			0.138	0.00	71.7	0.70	-	0.05	0.00	76.5	176.2	83.3	73.6
333			0.138	0.00	71.8	0.69	-	0.04	-0.01	76.5	175.6	83.3	73.7
334			0.138	0.00	71.7	0.69	-	0.04	0.00	76.5	174.9	83.3	73.5
335			0.138	0.00	71.7	0.69	-	0.04	0.00	76.4	174.1	83.3	73.5
336			0.139	0.00	71.7	0.69	-	0.03	0.00	76.4	173.4	83.2	73.5
337			0.138	0.00	71.7	0.69	-	0.02	-0.01	76.3	172.7	83.2	73.4
338			0.138	0.00	71.7	0.69	-	0.02	0.00	76.3	171.7	83.3	73.3
339			0.138	0.00	71.6	0.70	-	0.02	0.00	76.3	171.3	83.3	73.1
340	59.815	0.179	0.137	0.00	71.6	0.71	100	0.01	-0.01	76.2	170.6	83.3	73.0
341			0.138	0.00	71.6	0.69	-	0.00	-0.01	76.2	170.0	83.3	73.5
342	60.183	0.184	0.139	0.00	71.6	0.70	105	0.00	0.00	76.2	169.9	83.3	73.5
Avg/Tot	60.183	0.176	0.135	0.00	72.6	0.57	100			87.2	323.3	84.0	77.6

Data from 12/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	72.9	0.45		82.7	-0.069	2.32	0.065	9.7	49.1
1			0.00	72.9	0.41	-	81.8	-0.078	2.16	0.152	11.9	53.8
2			0.00	72.9	0.42	-	81.5	-0.091	3.42	0.150	14.0	56.8
3			0.00	72.9	0.49	-	81.3	-0.091	4.95	0.340	14.3	59.7
4			0.00	72.9	0.48	-	80.3	-0.093	12.91	0.338	13.9	58.6
5			0.00	72.8	0.42	-	80.5	-0.095	12.39	0.183	18.1	60.6
6			0.00	72.9	0.46	-	80.7	-0.095	12.91	0.287	18.5	60.6
7			0.00	73.0	0.48	-	81.1	-0.095	12.63	0.189	19.3	59.4
8			0.00	73.0	0.49	-	81.9	-0.095	13.67	0.305	19.2	59.4
9			0.00	73.0	0.50	-	83.3	-0.095	13.43	0.232	20.7	58.8
10	1.756	0.176	0.00	73.0	0.43	104	84.8	-0.093	12.37	0.168	21.3	57.4
11			0.00	73.0	0.41	-	86.0	-0.093	11.45	0.126	21.0	56.8
12			0.00	73.0	0.45	-	86.4	-0.092	11.18	0.107	19.7	57.6
13			0.00	73.0	0.43	-	86.8	-0.094	11.19	0.106	19.3	57.4
14			0.00	73.0	0.42	-	87.2	-0.094	10.97	0.135	19.4	58.5
15			0.00	73.0	0.51	-	86.8	-0.095	12.81	0.575	18.6	58.6
16			0.00	73.0	0.41	-	86.2	-0.090	14.66	0.430	19.5	58.8
17			0.00	73.1	0.4	-	85.6	-0.089	13.51	0.221	20.3	57.7
18			0.00	73.0	0.47	-	85.0	-0.086	11.67	0.119	21.1	55.6
19			0.00	73.0	0.48	-	84.6	-0.084	9.49	0.260	21.4	53.6
20	3.479	0.172	0.00	72.9	0.44	100	84.4	-0.082	7.84	0.387	20.8	52.9
21			0.00	72.9	0.46	-	84.2	-0.078	7.23	0.473	19.7	52.7
22			0.00	72.9	0.45	-	83.9	-0.077	7.06	0.505	19.0	52.3
23			0.00	72.9	0.44	-	83.6	-0.077	7.01	0.516	18.8	51.8
24			0.00	72.9	0.48	-	83.4	-0.075	6.92	0.528	18.7	51.3
25			0.00	72.9	0.49	-	83.0	-0.073	6.84	0.548	18.8	50.9
26			0.00	72.8	0.45	-	82.5	-0.073	5.98	0.704	19.7	49.5
27			0.00	72.8	0.45	-	82.3	-0.073	6.06	0.673	20.8	48.6
28			0.00	72.8	0.41	-	82.2	-0.074	6.37	0.613	20.6	49.3
29			0.00	72.8	0.49	-	82.2	-0.076	8.24	0.431	19.7	50.0
30	5.200	0.172	0.00	72.8	0.50	100	82.2	-0.077	9.23	0.361	19.8	50.9
31			0.00	72.8	0.50	-	82.1	-0.078	9.59	0.314	19.8	51.1
32			0.00	72.8	0.41	-	82.1	-0.079	10.43	0.284	20.0	51.3
33			0.00	72.8	0.47	-	82.0	-0.079	10.95	0.259	20.1	51.6
34			0.00	72.8	0.50	-	82.0	-0.081	11.35	0.239	20.2	51.8
35			0.00	72.7	0.46	-	82.3	-0.081	11.75	0.218	20.4	52.2
36			0.00	72.7	0.50	-	82.7	-0.082	11.96	0.241	20.5	52.3
37			0.00	72.7	0.49	-	83.1	-0.082	12.14	0.246	20.5	52.5
38			0.00	72.7	0.48	-	83.4	-0.082	12.16	0.305	20.5	53.1

Data from 12/19/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	72.7	0.42	-	83.7	-0.082	12.27	0.313	20.4	52.7
40	6.920	0.172	0.00	72.7	0.45	99	83.9	-0.082	12.36	0.264	20.7	52.7
41			0.00	72.8	0.51	-	84.2	-0.083	12.42	0.215	20.8	52.5
42			0.00	72.8	0.49	-	84.3	-0.083	12.52	0.229	21.6	52.2
43			0.00	72.8	0.44	-	84.5	-0.083	12.50	0.182	22.2	52.2
44			0.00	72.9	0.47	-	84.6	-0.083	12.64	0.139	22.3	51.8
45			0.00	72.9	0.50	-	84.8	-0.084	12.85	0.112	22.4	51.8
46			0.00	72.9	0.46	-	84.9	-0.083	12.87	0.145	22.6	51.6
47			0.00	72.9	0.48	-	85.0	-0.084	12.98	0.125	22.8	51.8
48			0.00	72.9	0.45	-	85.1	-0.084	12.93	0.155	22.9	51.8
49			0.00	72.9	0.43	-	85.2	-0.085	13.03	0.207	22.8	51.6
50	8.647	0.173	0.00	72.9	0.44	99	85.3	-0.085	13.22	0.244	22.9	51.8
51			0.00	73.0	0.50	-	85.5	-0.084	13.13	0.244	23.1	51.8
52			0.00	72.9	0.49	-	85.6	-0.085	12.93	0.217	23.0	51.8
53			0.00	72.9	0.45	-	85.8	-0.085	13.00	0.152	22.9	51.4
54			0.00	72.9	0.48	-	85.9	-0.085	12.98	0.179	22.8	51.4
55			0.00	72.8	0.44	-	85.9	-0.084	11.00	0.122	22.8	51.4
56			0.00	72.9	0.44	-	86.1	-0.084	13.08	0.115	22.9	51.4
57			0.00	72.9	0.49	-	86.1	-0.085	13.20	0.114	22.9	51.3
58			0.00	72.9	0.49	-	86.2	-0.084	13.35	0.155	22.9	51.3
59			0.00	72.9	0.51	-	86.4	-0.083	13.50	0.158	23.0	51.3
60	10.366	0.172	0.00	72.9	0.49	98	86.6	-0.083	13.37	0.162	23.1	51.3
61			0.00	72.9	0.46	-	86.7	-0.084	13.33	0.161	23.1	51.3
62			0.00	72.9	0.43	-	86.7	-0.082	13.29	0.179	23.1	51.3
63			0.00	73.0	0.48	-	86.8	-0.082	13.42	0.207	23.1	51.1
64			0.00	72.9	0.45	-	86.8	-0.082	13.44	0.129	23.3	51.3
65			0.00	72.9	0.44	-	86.8	-0.083	13.57	0.138	23.3	51.1
66			0.00	72.8	0.45	-	86.7	-0.083	13.40	0.158	23.3	51.1
67			0.00	72.9	0.44	-	86.7	-0.083	13.81	0.116	23.3	50.9
68			0.00	72.9	0.51	-	86.6	-0.084	13.67	0.108	23.3	50.7
69			0.00	72.9	0.48	-	86.6	-0.082	13.75	0.123	23.3	50.7
70	12.082	0.172	0.00	73.0	0.47	98	86.5	-0.083	13.60	0.130	23.3	50.5
71			0.00	73.0	0.45	-	86.4	-0.083	13.58	0.104	23.2	50.5
72			0.00	73.0	0.52	-	86.3	-0.082	13.78	0.092	23.2	50.5
73			0.00	73.0	0.50	-	86.3	-0.083	13.76	0.064	23.2	50.5
74			0.00	73.0	0.51	-	86.1	-0.083	13.60	0.106	23.2	50.4
75			0.00	73.0	0.51	-	86.0	-0.083	13.70	0.088	23.1	50.4
76			0.00	73.0	0.46	-	85.9	-0.084	13.87	0.106	23.1	50.2
77			0.00	73.0	0.51	-	85.7	-0.083	14.16	0.087	23.2	50.4

Data from 12/19/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	73.0	0.53	-	85.5	-0.086	14.29	0.082	23.2	50.4
79			0.00	73.0	0.45	-	85.4	-0.084	14.41	0.102	23.2	50.4
80	13.804	0.172	0.00	72.9	0.54	98	85.3	-0.085	14.67	0.126	23.2	50.4
81			0.00	72.9	0.53	-	85.3	-0.083	14.63	0.070	23.2	50.4
82			0.00	72.9	0.49	-	85.1	-0.084	14.56	0.073	23.1	50.4
83			0.00	72.9	0.50	-	85.0	-0.085	14.70	0.143	23.2	50.4
84			0.00	72.9	0.57	-	85.0	-0.085	14.93	0.133	23.2	50.4
85			0.00	72.9	0.61	-	84.8	-0.085	14.89	0.164	23.1	50.4
86			0.00	72.9	0.61	-	84.7	-0.086	15.02	0.190	23.0	50.4
87			0.00	72.9	0.72	-	84.6	-0.086	15.03	0.249	23.0	50.4
88			0.00	72.9	0.75	-	84.4	-0.085	15.17	0.226	23.0	50.4
89			0.00	72.9	0.78	-	84.4	-0.086	15.16	0.280	23.0	50.5
90	15.512	0.171	0.00	72.9	0.79	97	83.8	-0.086	15.16	0.282	22.8	50.5
91			0.00	72.9	0.82	-	83.6	-0.085	14.55	0.163	22.7	50.4
92			0.00	72.9	0.82	-	83.3	-0.084	13.99	0.167	22.6	50.0
93			0.00	72.9	0.83	-	83.0	-0.084	13.79	0.172	22.4	49.6
94			0.00	72.9	0.82	-	82.7	-0.083	13.82	0.113	22.2	49.3
95			0.00	72.9	0.81	-	82.5	-0.084	13.64	0.150	22.2	49.3
96			0.00	72.9	0.87	-	82.3	-0.083	13.24	0.132	22.2	49.1
97			0.00	72.9	0.84	-	82.1	-0.082	13.13	0.128	22.1	48.7
98			0.00	72.9	0.90	-	81.9	-0.083	12.91	0.117	22.1	48.7
99			0.00	72.8	0.91	-	82.2	-0.083	12.98	0.067	22.1	48.4
100	17.236	0.172	0.00	72.9	0.85	99	82.7	-0.084	12.90	0.122	21.8	48.4
101			0.00	72.9	0.85	-	83.2	-0.082	12.79	0.081	21.6	48.2
102			0.00	72.9	0.91	-	83.6	-0.082	12.67	0.089	21.4	48.0
103			0.00	72.9	0.96	-	84.1	-0.082	12.34	0.062	21.4	47.8
104			0.00	72.9	0.94	-	84.5	-0.079	11.53	0.010	21.3	47.7
105			0.00	72.9	0.96	-	84.9	-0.080	10.79	0.045	21.0	47.1
106			0.00	72.8	0.90	-	85.3	-0.079	10.39	0.029	20.7	46.6
107			0.00	72.8	0.96	-	85.6	-0.079	10.00	0.081	20.5	46.2
108			0.00	72.8	0.88	-	86.0	-0.078	9.85	0.069	20.5	45.9
109			0.00	72.8	0.88	-	86.1	-0.077	9.44	0.069	20.4	45.7
110	18.973	0.174	0.00	72.8	0.93	99	86.4	-0.075	8.95	0.084	20.3	45.5
111			0.00	72.8	0.90	-	86.6	-0.075	8.72	0.102	20.3	45.0
112			0.00	72.8	0.93	-	86.9	-0.074	8.68	0.113	20.3	44.8
113			0.00	72.8	0.95	-	87.0	-0.073	8.72	0.096	20.4	44.6
114			0.00	72.8	0.94	-	87.3	-0.073	8.64	0.114	20.4	44.2
115			0.00	72.8	0.90	-	87.5	-0.072	8.59	0.113	20.4	44.1
116			0.00	72.8	0.95	-	87.8	-0.072	8.55	0.127	20.4	44.1

Data from 12/19/2022 testing - Reference only



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.00	72.9	0.89	-	87.8	-0.071	8.55	0.108	20.5	43.9
118			0.00	72.8	0.89	-	87.9	-0.071	8.54	0.091	20.5	43.9
119			0.00	72.8	0.89	-	87.5	-0.070	8.55	0.091	20.5	43.7
120	20.734	0.176	0.00	72.8	0.93	100	87.0	-0.070	8.51	0.089	20.5	43.5
121			0.00	72.7	0.90	-	86.6	-0.069	8.54	0.082	20.5	43.3
122			0.00	72.7	0.94	-	86.2	-0.069	8.57	0.078	20.5	43.3
123			0.00	72.7	0.93	-	85.8	-0.068	8.56	0.083	20.6	43.2
124			0.00	72.7	0.93	-	85.4	-0.069	8.57	0.075	20.6	43.2
125			0.00	72.7	0.88	-	84.9	-0.069	8.55	0.064	20.6	43.0
126			0.00	72.7	0.88	-	84.4	-0.068	8.55	0.075	20.6	42.8
127			0.00	72.7	0.92	-	84.0	-0.068	8.59	0.066	20.6	42.8
128			0.00	72.7	0.93	-	83.5	-0.068	8.52	0.064	20.6	42.6
129			0.00	72.8	0.93	-	83.1	-0.067	8.46	0.078	20.6	42.4
130	22.506	0.177	0.00	72.7	0.88	100	82.7	-0.067	8.45	0.076	20.6	42.4
131			0.00	72.7	0.86	-	82.4	-0.066	8.33	0.073	20.6	42.3
132			0.00	72.7	0.86	-	82.0	-0.065	8.10	0.084	20.5	42.1
133			0.00	72.6	0.93	-	81.7	-0.065	7.83	0.111	20.4	41.7
134			0.00	72.6	0.87	-	81.4	-0.064	7.78	0.132	20.3	41.4
135			0.00	72.6	0.85	-	81.4	-0.064	7.70	0.152	20.3	41.2
136			0.00	72.6	0.86	-	81.4	-0.064	7.54	0.193	20.2	41.0
137			0.00	72.6	0.91	-	81.4	-0.063	7.53	0.202	20.3	41.0
138			0.00	72.6	0.86	-	81.5	-0.063	7.57	0.192	20.3	40.8
139			0.00	72.7	0.85	-	81.5	-0.063	7.61	0.187	20.3	40.8
140	24.277	0.177	0.00	72.6	0.85	101	81.5	-0.062	7.55	0.194	20.3	40.8
141			0.00	72.5	0.85	-	81.5	-0.062	7.54	0.176	20.3	40.6
142			0.00	72.5	0.92	-	81.5	-0.062	7.54	0.197	20.4	40.6
143			0.00	72.5	0.89	-	81.6	-0.061	7.57	0.181	20.4	40.5
144			0.00	72.4	0.84	-	81.7	-0.061	7.54	0.200	20.4	40.3
145			0.00	72.4	0.87	-	81.8	-0.061	7.51	0.191	20.4	40.3
146			0.00	72.4	0.84	-	81.9	-0.060	7.54	0.206	20.5	40.1
147			0.00	72.4	0.92	-	82.0	-0.060	7.47	0.225	20.5	40.1
148			0.00	72.4	0.84	-	82.3	-0.059	7.48	0.227	20.5	40.1
149			0.00	72.4	0.91	-	82.4	-0.059	7.45	0.239	20.5	39.9
150	26.047	0.177	0.00	72.4	0.89	100	82.6	-0.059	7.44	0.238	20.5	39.9
151			0.00	72.4	0.84	-	82.7	-0.059	7.44	0.244	20.5	39.7
152			0.00	72.4	0.90	-	82.8	-0.059	7.42	0.259	20.6	39.7
153			0.00	72.3	0.91	-	82.9	-0.058	7.41	0.267	20.6	39.7
154			0.00	72.3	0.86	-	83.0	-0.058	7.42	0.264	20.6	39.6
155			0.00	72.4	0.87	-	83.2	-0.058	7.40	0.282	20.6	39.6

Data from 12/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
156			0.00	72.4	0.85	-	83.2	-0.058	7.38	0.289	20.6	39.4
157			0.00	72.4	0.87	-	83.3	-0.058	7.45	0.288	20.6	39.4
158			0.00	72.5	0.87	-	83.4	-0.057	7.53	0.285	20.6	39.4
159			0.00	72.5	0.92	-	83.5	-0.057	7.52	0.282	20.6	39.4
160	27.814	0.177	0.00	72.5	0.84	100	83.6	-0.057	7.49	0.288	20.7	39.2
161			0.00	72.4	0.92	-	83.7	-0.057	7.51	0.287	20.7	39.2
162			0.00	72.3	0.83	-	83.9	-0.057	7.51	0.287	20.7	39.2
163			0.00	72.2	0.87	-	84.1	-0.057	7.55	0.284	20.7	39.2
164			0.00	72.2	0.89	-	84.3	-0.057	7.37	0.256	20.8	39.2
165			0.00	72.1	0.91	-	84.5	-0.056	7.39	0.246	20.8	39.2
166			0.00	72.1	0.91	-	84.7	-0.057	7.46	0.247	20.8	39.0
167			0.00	72.0	0.93	-	84.8	-0.055	7.41	0.247	20.8	39.0
168			0.00	72.1	0.91	-	85.0	-0.055	7.46	0.251	20.9	39.0
169			0.00	72.1	0.85	-	85.1	-0.055	7.28	0.279	20.8	39.0
170	29.580	0.177	0.00	72.2	0.93	99	85.2	-0.055	7.31	0.284	20.8	38.8
171			0.00	72.2	0.95	-	85.3	-0.055	7.26	0.281	20.8	38.8
172			0.00	72.2	0.89	-	85.5	-0.055	7.26	0.288	20.8	38.8
173			0.00	72.1	0.88	-	85.6	-0.054	7.24	0.289	20.9	38.7
174			0.00	72.1	0.89	-	85.7	-0.054	7.20	0.290	20.8	38.7
175			0.00	72.0	0.94	-	85.8	-0.054	7.35	0.314	20.9	38.7
176			0.00	72.0	0.87	-	85.9	-0.054	7.23	0.307	20.9	38.7
177			0.00	72.0	0.92	-	85.9	-0.053	7.23	0.308	20.9	38.7
178			0.00	72.1	0.93	-	86.0	-0.054	7.25	0.309	20.9	38.5
179			0.00	72.1	0.90	-	86.0	-0.054	7.24	0.319	20.9	38.5
180	31.370	0.179	0.00	72.1	0.86	101	85.9	-0.053	7.27	0.315	21.0	38.5
181			0.00	72.2	0.91	-	85.8	-0.053	7.30	0.338	21.0	38.5
182			0.00	72.2	0.93	-	85.8	-0.053	7.36	0.347	21.0	38.5
183			0.00	72.2	0.91	-	85.7	-0.053	7.27	0.346	21.1	38.5
184			0.00	72.2	0.88	-	85.7	-0.053	7.00	0.352	21.1	38.5
185			0.00	72.2	0.93	-	85.6	-0.052	7.06	0.360	21.0	38.5
186			0.00	72.2	0.89	-	85.5	-0.053	6.95	0.353	21.1	38.5
187			0.00	72.2	0.86	-	85.4	-0.052	7.12	0.365	21.1	38.3
188			0.00	72.2	0.90	-	85.2	-0.052	7.14	0.364	21.1	38.3
189			0.00	72.3	0.86	-	85.0	-0.052	6.94	0.353	21.1	38.3
190	33.163	0.179	0.00	72.2	0.86	101	84.8	-0.052	7.10	0.361	21.1	38.3
191			0.00	72.2	0.91	-	84.7	-0.052	6.94	0.351	21.2	38.3
192			0.00	72.2	0.93	-	84.5	-0.051	7.10	0.361	21.2	38.3
193			0.00	72.2	0.88	-	84.4	-0.051	6.95	0.354	21.3	38.3
194			0.00	72.1	0.89	-	84.3	-0.051	6.90	0.348	21.3	38.3

Data from 12/19/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
195			0.00	72.1	0.91	-	84.1	-0.051	7.09	0.364	21.3	38.3
196			0.00	72.0	0.92	-	84.0	-0.051	7.10	0.364	21.3	38.3
197			0.00	72.0	0.86	-	83.9	-0.051	7.07	0.365	21.4	38.1
198			0.00	72.0	0.85	-	83.8	-0.051	7.06	0.364	21.4	38.3
199			0.00	72.1	0.87	-	83.8	-0.051	7.07	0.369	21.4	38.1
200	34.956	0.179	0.00	72.0	0.86	101	83.4	-0.050	6.88	0.365	21.4	38.1
201			0.00	71.9	0.88	-	83.1	-0.051	6.84	0.366	21.4	38.1
202			0.00	71.9	0.91	-	82.9	-0.050	6.75	0.363	21.4	38.1
203			0.00	71.8	0.90	-	82.6	-0.050	6.84	0.369	21.4	38.1
204			0.00	71.7	0.92	-	82.4	-0.050	6.66	0.334	21.4	38.1
205			0.00	71.7	0.88	-	82.1	-0.050	6.66	0.331	21.5	38.1
206			0.00	71.5	0.85	-	81.8	-0.050	6.65	0.337	21.6	37.9
207			0.00	71.5	0.90	-	81.7	-0.050	6.66	0.342	21.6	37.9
208			0.00	71.5	0.91	-	82.2	-0.050	6.62	0.346	21.6	37.9
209			0.00	71.5	0.90	-	83.0	-0.050	6.59	0.351	21.5	37.9
210	36.757	0.180	0.00	71.5	0.87	101	83.7	-0.050	6.56	0.359	21.6	37.9
211			0.00	71.5	0.86	-	84.4	-0.050	6.52	0.362	21.6	37.9
212			0.00	71.6	0.88	-	85.0	-0.050	6.51	0.367	21.6	37.8
213			0.00	71.5	0.93	-	85.6	-0.050	6.48	0.373	21.6	37.8
214			0.00	71.5	0.86	-	86.2	-0.049	6.44	0.383	21.6	37.8
215			0.00	71.5	0.87	-	86.7	-0.049	6.38	0.385	21.6	37.8
216			0.00	71.4	0.87	-	87.3	-0.049	6.39	0.388	21.7	37.8
217			0.00	71.4	0.91	-	87.4	-0.049	6.33	0.387	21.7	37.8
218			0.00	71.5	0.92	-	87.2	-0.049	6.34	0.394	21.7	37.8
219			0.00	71.5	0.92	-	86.9	-0.049	6.32	0.394	21.7	37.8
220	38.553	0.180	0.00	71.5	0.90	101	86.6	-0.049	6.34	0.402	21.7	37.6
221			0.00	71.5	0.92	-	86.4	-0.048	6.31	0.399	21.7	37.6
222			0.00	71.4	0.92	-	86.2	-0.049	6.24	0.398	21.7	37.6
223			0.00	71.4	0.86	-	85.9	-0.048	6.25	0.398	21.8	37.6
224			0.00	71.4	0.90	-	85.7	-0.048	6.24	0.403	21.8	37.6
225			0.00	71.4	0.85	-	85.5	-0.048	6.17	0.400	21.8	37.6
226			0.00	71.4	0.93	-	85.3	-0.048	6.15	0.400	21.8	37.6
227			0.00	71.5	0.93	-	85.1	-0.048	5.89	0.388	21.9	37.6
228			0.00	71.5	0.92	-	84.9	-0.048	5.90	0.382	21.8	37.6
229			0.00	71.5	0.91	-	84.7	-0.047	5.67	0.357	21.9	37.6
230	40.348	0.180	0.00	71.5	0.88	101	84.5	-0.047	5.67	0.361	22.0	37.6
231			0.00	71.5	0.86	-	84.2	-0.047	5.66	0.364	22.0	37.6
232			0.00	71.6	0.87	-	84.0	-0.047	5.66	0.368	22.0	37.6
233			0.00	71.6	0.85	-	83.8	-0.047	5.61	0.364	22.1	37.6

Data from 12/19/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
234			0.00	71.5	0.89	-	83.6	-0.046	5.59	0.369	22.0	37.6
235			0.00	71.5	0.92	-	83.3	-0.046	5.61	0.373	22.1	37.6
236			0.00	71.5	0.93	-	83.2	-0.046	5.60	0.374	22.1	37.6
237			0.00	71.5	0.91	-	83.0	-0.046	5.55	0.369	22.1	37.6
238			0.00	71.5	0.91	-	82.8	-0.046	5.57	0.373	22.2	37.6
239			0.00	71.5	0.90	-	82.6	-0.046	5.54	0.374	22.2	37.6
240	42.138	0.179	0.00	71.5	0.87	100	82.4	-0.046	5.52	0.370	22.3	37.6
241			0.00	71.4	0.88	-	82.3	-0.046	5.49	0.370	22.3	37.6
242			0.00	71.4	0.90	-	82.1	-0.046	5.46	0.370	22.3	37.6
243			0.00	71.4	0.92	-	82.0	-0.046	5.44	0.369	22.3	37.6
244			0.00	71.4	0.86	-	81.9	-0.046	5.46	0.375	22.3	37.6
245			0.00	71.4	0.88	-	81.8	-0.045	5.45	0.372	22.4	37.6
246			0.00	71.3	0.91	-	81.7	-0.045	5.44	0.369	22.3	37.6
247			0.00	71.3	0.90	-	81.6	-0.045	5.43	0.369	22.4	37.4
248			0.00	71.3	0.91	-	81.4	-0.045	5.41	0.369	22.5	37.4
249			0.00	71.3	0.92	-	81.4	-0.044	5.38	0.365	22.5	37.4
250	43.933	0.179	0.00	71.2	0.86	100	81.3	-0.044	5.41	0.368	22.4	37.6
251			0.00	71.2	0.91	-	81.2	-0.044	5.38	0.363	22.4	37.4
252			0.00	71.2	0.89	-	81.2	-0.044	5.36	0.360	22.5	37.4
253			0.00	71.2	0.85	-	81.1	-0.044	5.35	0.360	22.5	37.4
254			0.00	71.2	0.86	-	81.0	-0.044	5.34	0.359	22.6	37.4
255			0.00	71.1	0.86	-	80.9	-0.044	5.32	0.357	22.6	37.4
256			0.00	71.1	0.88	-	80.7	-0.044	5.33	0.359	22.6	37.4
257			0.00	71.2	0.92	-	80.7	-0.043	5.36	0.360	22.7	37.4
258			0.00	71.2	0.92	-	80.8	-0.043	5.31	0.356	22.7	37.4
259			0.00	71.2	0.93	-	81.9	-0.042	5.28	0.359	22.7	37.4
260	45.725	0.179	0.00	71.3	0.87	100	83.1	-0.043	5.24	0.356	22.7	37.4
261			0.00	71.3	0.89	-	84.2	-0.043	5.26	0.358	22.8	37.4
262			0.00	71.4	0.89	-	85.2	-0.043	5.24	0.355	22.8	37.4
263			0.00	71.3	0.90	-	86.0	-0.043	5.23	0.354	22.8	37.4
264			0.00	71.3	0.93	-	87.0	-0.042	5.24	0.355	22.8	37.4
265			0.00	71.3	0.95	-	87.8	-0.042	5.24	0.354	22.9	37.4
266			0.00	71.2	0.91	-	88.5	-0.042	5.24	0.355	22.9	37.4
267			0.00	71.2	0.87	-	89.3	-0.042	5.22	0.353	22.9	37.4
268			0.00	71.1	0.87	-	89.6	-0.042	5.23	0.353	23.0	37.4
269			0.00	71.1	0.92	-	89.0	-0.042	5.22	0.352	22.9	37.4
270	47.523	0.180	0.00	71.1	0.88	100	88.2	-0.042	5.19	0.348	22.9	37.4
271			0.00	71.0	0.92	-	87.6	-0.042	5.19	0.350	23.0	37.4
272			0.00	71.0	0.87	-	87.0	-0.041	5.16	0.349	23.0	37.4

Data from 12/19/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
273			0.00	70.9	0.86	-	86.5	-0.042	5.15	0.350	23.0	37.4
274			0.00	71.0	0.86	-	86.1	-0.041	5.11	0.347	23.1	37.4
275			0.00	70.9	0.88	-	85.7	-0.041	5.06	0.342	23.1	37.4
276			0.00	71.0	0.94	-	85.2	-0.041	5.02	0.339	23.1	37.4
277			0.00	71.0	0.90	-	84.9	-0.041	5.06	0.346	23.1	37.4
278			0.00	70.9	0.87	-	84.6	-0.041	5.06	0.344	23.1	37.4
279			0.00	70.9	0.87	-	84.3	-0.041	4.99	0.345	23.2	37.4
280	49.303	0.178	0.00	70.9	0.93	100	84.0	-0.041	4.98	0.345	23.2	37.4
281			0.00	70.9	0.88	-	83.7	-0.041	4.97	0.344	23.2	37.2
282			0.00	71.0	0.85	-	83.4	-0.041	4.97	0.343	23.2	37.4
283			0.00	70.9	0.87	-	83.2	-0.040	4.95	0.341	23.3	37.2
284			0.00	70.8	0.93	-	82.9	-0.040	4.95	0.341	23.2	37.2
285			0.00	70.8	0.86	-	82.6	-0.040	4.94	0.337	23.3	37.2
286			0.00	70.7	0.86	-	82.3	-0.040	4.89	0.332	23.3	37.4
287			0.00	70.8	0.92	-	82.1	-0.040	4.90	0.332	23.3	37.2
288			0.00	70.8	0.92	-	82.3	-0.040	2.04	0.179	23.4	37.4
289			0.00	70.8	0.90	-	82.0	-0.040	4.42	0.560	20.5	38.1
290	51.094	0.179	0.00	70.9	0.99	101	82.1	-0.040	4.08	0.474	22.9	37.6
291			0.00	70.9	0.94	-	82.8	-0.040	3.94	0.454	23.1	37.4
292			0.00	70.9	0.93	-	83.5	-0.039	3.80	0.435	23.2	37.4
293			0.00	70.9	0.92	-	84.2	-0.039	3.69	0.423	23.4	37.4
294			0.00	70.9	0.94	-	84.8	-0.039	3.63	0.418	23.4	37.2
295			0.00	70.9	0.93	-	85.3	-0.039	3.56	0.410	23.4	37.2
296			0.00	70.9	0.89	-	85.9	-0.039	3.50	0.404	23.5	37.2
297			0.00	70.9	0.91	-	86.4	-0.039	3.46	0.399	23.5	37.2
298			0.00	70.9	0.91	-	87.0	-0.038	3.41	0.398	23.5	37.2
299			0.00	70.9	0.87	-	87.4	-0.038	3.36	0.390	23.5	37.2
300	52.882	0.179	0.00	71.0	0.88	100	87.8	-0.038	3.32	0.385	23.6	37.2
301			0.00	71.0	0.90	-	88.2	-0.038	3.27	0.379	23.6	37.2
302			0.00	70.9	0.89	-	88.5	-0.037	3.26	0.381	23.6	37.2
303			0.00	70.9	0.92	-	88.8	-0.036	3.22	0.374	23.6	37.2
304			0.00	70.9	0.95	-	89.1	-0.037	3.21	0.377	23.6	37.2
305			0.00	70.8	0.95	-	89.3	-0.036	3.18	0.368	23.7	37.2
306			0.00	70.8	0.95	-	89.4	-0.036	3.16	0.366	23.7	37.2
307			0.00	70.8	0.93	-	87.3	-0.036	3.14	0.362	23.8	37.2
308			0.00	71.0	0.91	-	85.9	-0.036	3.12	0.360	23.8	37.2
309			0.00	71.0	0.90	-	85.3	-0.035	3.11	0.360	23.8	37.2
310	54.669	0.179	0.00	71.0	0.88	100	84.8	-0.036	3.11	0.361	23.9	37.2
311			0.00	70.9	0.87	-	84.2	-0.035	3.09	0.358	23.9	37.2

Data from 12/19/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
312			0.00	71.0	0.91	-	83.7	-0.035	3.10	0.360	23.9	37.2
313			0.00	71.0	0.91	-	83.2	-0.035	3.05	0.352	23.9	37.2
314			0.00	71.0	0.92	-	82.7	-0.034	3.06	0.354	24.0	37.2
315			0.00	71.0	0.92	-	82.3	-0.034	3.03	0.346	24.0	37.0
316			0.00	71.0	0.94	-	82.0	-0.034	3.03	0.345	24.0	37.0
317			0.00	71.0	0.87	-	81.9	-0.034	3.03	0.344	24.0	37.0
318			0.00	71.0	0.92	-	81.8	-0.034	2.99	0.338	24.1	37.0
319			0.00	71.0	0.92	-	81.7	-0.034	2.97	0.333	24.1	37.0
320	56.463	0.179	0.00	71.0	0.87	100	81.8	-0.034	3.01	0.343	24.2	37.0
321			0.00	70.9	0.88	-	81.7	-0.034	2.97	0.336	24.1	37.0
322			0.00	70.9	0.92	-	81.7	-0.034	2.96	0.329	24.2	37.0
323			0.00	70.9	0.88	-	81.7	-0.034	2.96	0.331	24.2	37.0
324			0.00	70.9	0.94	-	81.7	-0.033	2.93	0.327	24.3	37.0
325			0.00	70.9	0.88	-	81.7	-0.033	2.91	0.323	24.2	37.0
326			0.00	71.0	0.92	-	82.0	-0.033	2.90	0.322	24.2	37.0
327			0.00	71.0	0.93	-	83.0	-0.032	2.89	0.321	24.3	37.0
328			0.00	71.0	0.92	-	83.9	-0.032	2.88	0.318	24.3	37.0
329			0.00	71.0	0.88	-	84.8	-0.032	2.88	0.321	24.3	37.0
330	58.253	0.179	0.00	71.0	0.94	100	85.7	-0.032	2.86	0.319	24.3	37.0
331			0.00	71.1	0.87	-	86.5	-0.032	2.83	0.312	24.4	37.0
332			0.00	71.1	0.93	-	87.3	-0.032	2.77	0.307	24.4	37.0
333			0.00	71.1	0.88	-	88.0	-0.031	2.77	0.309	24.5	37.0
334			0.00	71.2	0.92	-	88.6	-0.032	2.67	0.296	24.5	37.0
335			0.00	71.1	0.89	-	89.3	-0.031	2.69	0.301	24.5	37.0
336			0.00	71.0	0.91	-	86.5	-0.031	2.67	0.295	24.5	37.0
337			0.00	71.0	0.91	-	81.8	-0.031	2.64	0.290	24.6	37.0
338			0.00	71.0	0.91	-	84.2	-0.031	2.64	0.290	24.7	37.0
339			0.00	71.0	0.93	-	83.7	-0.030	2.62	0.284	24.7	37.0
340	60.044	0.179	0.00	71.0	0.87	100	83.2	-0.030	2.62	0.286	24.7	37.0
341			0.00	71.0	0.89	-	82.7	-0.030	2.62	0.285	24.7	37.0
342	60.416	0.186	0.00	70.9	106.00	106	82.3	-0.030	2.63	0.286	24.8	37.0
Avg/Tot	60.416	0.177	0.00	72.0	1.09	100	84.3	-0.060	7.81	0.275	21.82	42.779

Data from 12/19/2022 testing - Reference only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	73.7	0.23		86.6
1			0.00	73.7	0.24	-	86.3
2			0.00	73.7	0.23		86.5
3			0.00	73.7	0.24	-	86.7
4			0.00	73.7	0.23	-	86.0
5			0.00	73.7	0.23	-	85.6
6			0.00	73.7	0.24	-	85.3
7			0.00	73.8	0.23	-	85.2
8			0.00	73.8	0.24	-	84.8
9			0.00	73.9	0.22	-	84.4
10	1.771	0.177	0.00	73.9	0.24	107	84.0
11			0.00	73.9	0.25	-	84.1
12			0.00	73.9	0.23	-	84.1
13			0.00	73.8	0.25	-	84.1
14			0.00	73.8	0.24	-	84.3
15			0.00	73.8	0.25	-	84.1
16			0.00	73.8	0.24	-	83.6
17			0.00	73.8	0.23	-	83.2
18			0.00	73.7	0.23	-	82.7
19			0.00	73.7	0.22	-	82.4
20	3.501	0.173	0.00	73.6	0.22	103	82.1
21			0.00	73.6	0.22	-	81.8
22			0.00	73.5	0.21	-	81.5
23			0.00	73.6	0.21	-	81.6
24			0.00	73.5	0.22	-	82.4
25			0.00	73.5	0.22	-	83.0
26			0.00	73.5	0.21	-	83.3
27			0.00	73.5	0.23	-	83.9
28			0.00	73.4	0.23	-	84.5
29			0.00	73.5	0.25	-	85.1
30	5.210	0.171	0.00	73.5	0.25	101	85.5
31			0.00	73.4	0.26	-	86.0

Data from 12/2022 testing - Reference only

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	73.4	0.27	-	86.5
33			0.00	73.4	0.25	-	86.9
34			0.00	73.4	0.26	-	87.0
35			0.00	73.3	0.26	-	86.7
36			0.00	73.3	0.27	-	86.5
37			0.00	73.3	0.25	-	86.1
38			0.00	73.3	0.26	-	85.8
39			0.00	73.3	0.26	-	85.6
40	6.938	0.173	0.00	73.4	0.27	102	85.2
41			0.00	73.4	0.27	-	84.8
42			0.00	73.4	0.27	-	84.6
43			0.00	73.5	0.25	-	84.4
44			0.00	73.5	0.25	-	84.1
45			0.00	73.6	0.25	-	83.8
46			0.00	73.5	0.25	-	83.6
47			0.00	73.5	0.26	-	83.6
48			0.00	73.5	0.26	-	83.4
49			0.00	73.5	0.25	-	83.3
50	8.661	0.172	0.00	73.5	0.25	101	83.2
51			0.00	73.6	0.25	-	82.9
52			0.00	73.6	0.25	-	82.8
53			0.00	73.5	0.25	-	82.8
54			0.00	73.5	0.26	-	82.7
55			0.00	73.5	0.26	-	82.5
56			0.00	73.5	0.26	-	82.4
57			0.00	73.5	0.26	-	82.3
58			0.00	73.6	0.25	-	82.2
59			0.00	73.6	0.26	-	82.2
60	10.388	0.173	0.00	73.6	0.26	101	82.2
Avg/Tot	10.388	0.173	0.00	73.6	0.24	103	84.2



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	593.9	408.7	477.0	399.7	419.6	459.8	0
1	558.6	410.2	477.2	399.5	418.6	452.8	0
2	543.8	411.8	474.6	399.1	417.7	449.4	0
3	554.8	412.9	469.5	397.6	416.4	450.2	0
4	576.8	412.1	462.2	395.7	413.9	452.1	0
5	597.7	410.9	453.8	393.7	411.2	453.4	0
6	617.4	409.5	445.1	391.6	408.9	454.5	0
7	636.2	407.7	437.3	389.0	406.1	455.2	0
8	655.4	405.8	429.6	386.7	404.1	456.3	0
9	671.5	404.3	423.0	385.0	402.4	457.2	0
10	679.9	402.3	417.5	382.9	400.7	456.7	0
11	683.3	400.3	412.6	380.1	398.6	455.0	0
12	683.4	397.9	408.4	377.4	396.1	452.7	0
13	681.2	395.4	404.7	374.2	393.5	449.8	0
14	677.7	393.0	401.4	371.2	390.5	446.7	0
15	680.8	390.6	397.6	369.3	388.0	445.3	0
16	687.2	385.4	394.3	367.0	385.7	443.9	0
17	693.6	380.5	391.4	364.9	384.2	442.9	0
18	694.3	376.2	389.1	363.2	383.1	441.2	0
19	688.8	372.3	386.8	361.4	381.4	438.2	0
20	677.1	369.5	384.2	359.8	379.3	434.0	0
21	662.0	366.9	381.3	358.3	376.9	429.1	0
22	645.6	364.1	378.0	356.8	374.3	423.8	0
23	629.7	361.4	374.5	354.9	371.9	418.5	0
24	614.6	358.7	370.6	353.2	369.4	413.3	0
25	601.0	356.0	366.7	351.3	367.6	408.5	0
26	586.3	353.2	363.0	349.9	365.6	403.6	0
27	572.8	350.5	359.3	347.9	363.7	398.8	0
28	562.4	348.4	355.5	346.0	360.8	394.6	0
29	557.8	346.0	351.7	343.7	357.8	391.4	0
30	559.6	343.5	347.9	341.7	354.8	389.5	0
31	564.3	341.1	344.3	339.7	351.7	388.2	0
32	572.7	338.5	341.0	337.9	348.7	387.8	0
33	583.5	336.0	338.0	336.0	345.8	387.8	0
34	594.9	333.5	335.4	334.3	342.9	388.2	0
35	607.0	331.2	333.1	333.0	340.0	388.9	0
36	618.3	328.8	331.2	331.5	336.8	389.3	0
37	629.8	326.3	329.7	330.3	333.6	389.9	0
38	640.2	323.8	328.4	329.3	330.7	390.5	0
39	649.4	321.5	327.4	328.6	327.7	390.9	0
40	658.4	319.2	326.8	328.1	325.3	391.5	0
41	665.6	317.0	326.2	327.5	323.1	391.9	0
42	671.8	314.9	325.6	327.1	321.1	392.1	0
43	677.3	312.6	325.3	326.9	319.3	392.3	0
44	682.5	310.4	325.1	326.7	317.6	392.4	0
45	687.4	308.4	325.0	326.7	316.2	392.7	0
46	692.8	306.4	325.0	327.1	314.8	393.2	0
47	697.3	304.3	325.0	327.3	313.4	393.5	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	701.4	302.3	325.1	327.4	312.2	393.7	0
49	705.7	300.5	325.2	327.8	311.2	394.1	0
50	709.5	298.7	325.4	328.1	310.2	394.4	0
51	712.3	296.9	325.6	328.4	309.2	394.5	0
52	714.6	295.1	325.7	328.6	308.5	394.5	0
53	715.0	293.3	326.0	329.1	307.7	394.2	0
54	715.5	291.8	326.3	329.2	307.0	394.0	0
55	716.3	290.3	326.7	329.6	306.3	393.9	0
56	715.5	288.7	327.0	330.1	305.6	393.4	0
57	713.5	287.2	327.5	330.5	305.1	392.8	0
58	710.8	285.8	328.0	330.7	304.3	392.0	0
59	708.7	284.5	328.5	331.4	304.3	391.5	0
60	705.9	283.2	329.0	331.7	304.0	390.8	0
61	703.3	282.2	329.6	331.7	302.7	389.9	0
62	701.7	281.2	330.5	332.0	301.9	389.5	0
63	701.1	280.1	331.4	332.4	301.2	389.3	0
64	700.5	278.9	332.2	332.6	301.1	389.1	0
65	701.9	277.8	333.2	332.9	301.2	389.4	0
66	701.0	276.9	334.2	333.2	301.1	389.3	0
67	702.0	275.8	335.5	333.6	301.3	389.6	0
68	703.9	274.7	335.8	333.8	301.3	390.1	0
69	705.6	273.5	337.2	334.2	301.7	390.7	0
70	706.3	272.4	339.6	334.5	301.8	390.9	0
71	707.3	271.2	340.9	334.8	302.3	391.3	0
72	709.8	270.0	342.2	335.1	302.6	391.9	0
73	712.5	268.8	343.4	335.5	303.1	392.6	0
74	714.2	267.6	344.6	335.7	303.4	393.1	0
75	717.2	266.3	345.8	336.0	304.0	393.9	0
76	721.5	265.2	346.9	336.4	304.8	395.0	0
77	728.2	264.1	347.9	336.6	305.9	396.5	0
78	735.3	263.0	349.0	336.9	306.7	398.2	0
79	742.6	261.9	350.0	337.4	307.4	399.9	0
80	749.7	260.8	350.9	337.7	308.3	401.5	0
81	756.0	260.0	351.9	338.1	308.9	403.0	0
82	762.1	259.0	352.8	338.5	309.7	404.4	0
83	767.1	258.2	353.8	338.8	310.4	405.7	0
84	772.3	257.3	354.8	339.1	311.1	406.9	0
85	777.9	256.5	355.8	339.7	312.0	408.4	0
86	783.7	255.5	356.8	339.8	313.0	409.7	0
87	788.8	254.8	357.8	340.3	313.6	411.0	0
88	793.6	254.1	358.7	340.7	314.6	412.3	0
89	797.9	253.5	359.8	341.0	315.3	413.5	0
90	801.3	253.0	360.9	341.4	315.8	414.5	0
91	803.8	252.5	362.2	341.8	316.5	415.4	0
92	803.5	252.0	363.7	342.3	317.1	415.7	0
93	799.5	251.7	365.2	342.7	317.7	415.4	0
94	796.4	251.2	366.9	343.3	318.5	415.3	0
95	793.2	250.7	368.5	343.8	319.4	415.1	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
96	787.9	249.9	369.8	344.5	320.9	414.6	0
97	780.9	249.3	371.0	345.1	321.7	413.6	0
98	772.9	248.7	372.1	346.2	323.4	412.7	0
99	766.5	248.3	373.2	346.9	325.0	412.0	0
100	759.9	247.9	374.3	347.8	326.5	411.3	0
101	755.0	247.8	375.3	348.5	327.7	410.9	0
102	751.6	247.6	376.1	349.0	328.9	410.6	0
103	748.4	247.4	376.8	349.6	329.9	410.4	0
104	742.9	247.3	377.4	350.2	330.7	409.7	0
105	734.7	247.2	377.8	350.7	331.4	408.4	0
106	726.1	247.2	378.1	351.0	332.2	406.9	0
107	718.4	247.3	378.3	351.3	332.9	405.7	0
108	710.8	247.4	378.3	351.6	333.5	404.3	0
109	701.9	247.7	378.2	351.7	334.0	402.7	0
110	692.3	248.1	378.1	351.9	334.4	401.0	0
111	681.9	248.5	378.0	352.1	334.8	399.1	0
112	671.2	248.9	377.7	352.4	335.0	397.0	0
113	660.9	249.4	377.5	352.3	335.1	395.1	0
114	651.6	250.0	377.5	352.4	335.2	393.3	0
115	642.8	250.6	377.3	352.6	335.3	391.7	0
116	634.5	251.1	377.2	352.8	335.5	390.2	0
117	626.7	251.9	377.2	352.8	335.6	388.8	0
118	619.5	252.7	377.1	352.9	335.8	387.6	0
119	612.9	253.3	377.2	352.9	336.2	386.5	0
120	606.9	253.9	377.2	352.9	336.4	385.5	0
121	601.9	254.8	377.3	353.0	336.8	384.7	0
122	596.9	255.6	377.5	352.8	337.2	384.0	0
123	592.8	256.4	377.7	352.8	337.7	383.5	0
124	588.7	257.1	377.9	352.5	338.1	382.9	0
125	584.8	258.0	378.2	352.3	338.6	382.4	0
126	581.0	258.9	378.5	352.2	339.0	381.9	0
127	577.9	259.7	378.8	352.1	339.6	381.6	0
128	574.9	260.6	379.2	351.9	340.1	381.3	0
129	572.6	261.5	379.6	351.7	340.8	381.2	0
130	570.6	262.4	380.1	351.4	341.4	381.2	0
131	568.3	263.3	380.5	351.2	341.9	381.1	0
132	564.9	264.3	381.0	350.9	342.5	380.7	0
133	560.5	265.3	381.4	350.5	343.1	380.2	0
134	555.5	266.3	381.7	350.3	343.7	379.5	0
135	550.5	267.2	382.0	350.0	344.3	378.8	0
136	545.1	268.2	382.3	349.6	344.9	378.0	0
137	539.6	269.1	382.6	349.2	345.5	377.2	0
138	534.5	270.0	382.9	348.8	345.9	376.4	0
139	529.7	271.1	383.3	348.5	346.4	375.8	0
140	525.2	272.0	383.7	348.1	346.9	375.2	0
141	521.2	273.0	384.1	347.8	347.4	374.7	0
142	516.7	274.0	384.5	347.2	347.8	374.0	0
143	512.9	275.1	385.0	346.7	348.2	373.6	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
144	508.8	276.1	385.5	346.1	348.5	373.0	0
145	504.8	277.0	385.9	345.7	348.9	372.4	0
146	501.2	278.0	386.4	345.1	349.3	372.0	0
147	497.6	279.0	386.9	344.8	349.6	371.6	0
148	493.8	280.1	387.5	344.3	349.8	371.1	0
149	490.2	281.2	388.0	343.9	350.1	370.7	0
150	486.6	282.1	388.5	343.6	350.4	370.2	0
151	483.1	283.1	389.2	343.2	350.6	369.8	0
152	479.7	284.1	389.7	342.6	350.8	369.4	0
153	476.6	285.1	390.2	342.1	350.9	369.0	0
154	473.2	286.0	390.7	341.7	351.0	368.5	0
155	470.4	287.1	391.3	341.5	351.1	368.3	0
156	467.3	288.2	391.9	340.9	351.3	367.9	0
157	464.5	289.2	392.4	340.6	351.4	367.6	0
158	461.9	290.1	392.9	340.2	351.5	367.3	0
159	459.3	291.0	393.5	339.9	351.5	367.0	0
160	457.2	292.0	394.0	339.5	351.5	366.8	0
161	455.2	293.0	394.4	338.8	351.3	366.5	0
162	453.6	293.9	394.9	338.3	351.1	366.4	0
163	452.1	294.9	395.4	337.7	351.1	366.2	0
164	451.8	295.9	395.7	337.4	351.1	366.4	0
165	451.7	296.8	395.8	337.0	350.8	366.4	0
166	451.4	297.7	395.8	336.8	350.8	366.5	0
167	451.0	298.5	395.7	336.5	350.7	366.5	0
168	450.2	299.4	395.6	336.0	350.6	366.3	0
169	449.0	300.1	395.2	335.1	350.4	366.0	0
170	447.6	301.0	394.8	334.6	350.2	365.7	0
171	446.2	301.7	394.4	334.0	350.1	365.3	0
172	444.4	302.4	393.9	333.6	349.9	364.8	0
173	443.2	303.1	393.3	333.2	349.7	364.5	0
174	441.3	303.9	392.8	332.7	349.3	364.0	0
175	439.5	304.4	392.1	331.9	349.0	363.4	0
176	438.0	305.1	391.5	331.1	348.6	362.8	0
177	436.5	305.7	390.9	330.6	348.2	362.4	0
178	434.8	306.3	390.3	330.4	347.9	361.9	0
179	433.3	306.8	389.8	329.6	347.6	361.4	0
180	432.0	307.3	389.2	329.2	347.2	361.0	0
181	431.1	307.7	388.6	328.6	346.9	360.6	0
182	430.3	308.1	388.0	327.8	346.3	360.1	0
183	429.1	308.6	387.4	327.0	346.0	359.6	0
184	427.7	309.0	387.0	326.6	345.6	359.2	0
185	426.8	309.4	386.5	326.2	345.1	358.8	0
186	425.4	309.8	385.9	325.6	344.6	358.3	0
187	424.1	310.0	385.2	324.8	344.1	357.6	0
188	422.8	310.3	384.6	324.1	343.5	357.1	0
189	421.4	310.6	384.0	323.3	342.8	356.4	0
190	420.2	310.8	383.5	322.5	342.2	355.9	0
191	419.3	311.0	382.9	321.8	341.6	355.3	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
192	418.3	311.2	382.5	321.4	341.1	354.9	0	
193	417.2	311.4	382.0	321.2	340.6	354.5	0	
194	416.5	311.5	381.6	320.7	340.0	354.0	0	
195	415.6	311.5	381.1	319.8	339.3	353.5	0	
196	414.6	311.6	380.5	319.0	338.6	352.9	0	
197	413.7	311.6	380.0	318.6	337.9	352.4	0	
198	412.7	311.7	379.6	318.1	337.2	351.9	0	
199	411.5	311.7	379.2	317.6	336.7	351.3	0	
200	410.3	311.6	378.8	316.9	336.1	350.8	0	
201	409.1	311.6	378.3	316.3	335.4	350.1	0	
202	407.7	311.6	377.8	315.4	334.6	349.4	0	
203	406.3	311.6	377.5	315.2	334.0	348.9	0	
204	404.8	311.6	376.9	315.1	333.5	348.4	0	
205	403.6	311.7	376.5	314.7	332.9	347.9	0	
206	402.5	311.7	375.8	314.1	332.3	347.3	0	
207	401.6	311.5	375.1	313.7	331.6	346.7	0	
208	400.6	311.4	374.4	313.3	331.0	346.1	0	
209	399.7	311.4	373.7	312.5	330.3	345.5	0	
210	398.8	311.4	372.8	312.2	329.7	345.0	0	
211	398.1	311.4	372.0	311.9	328.8	344.4	0	
212	397.2	311.3	371.3	311.3	328.1	343.8	0	
213	396.2	311.2	370.4	311.1	327.3	343.3	0	
214	395.3	311.3	369.7	310.7	326.5	342.7	0	
215	394.2	311.2	369.0	310.4	325.7	342.1	0	
216	393.2	311.1	368.2	310.4	324.8	341.5	0	
217	392.5	310.9	367.5	310.1	324.0	341.0	0	
218	391.5	310.6	366.8	309.7	323.3	340.4	0	
219	390.6	310.5	366.1	309.2	322.5	339.8	0	
220	389.8	310.3	365.4	308.6	321.9	339.2	0	
221	388.9	310.1	364.7	308.4	321.1	338.6	0	
222	388.0	310.1	364.0	308.0	320.3	338.1	0	
223	387.2	309.9	363.2	307.6	319.7	337.5	0	
224	386.4	309.8	362.5	307.5	319.0	337.0	0	
225	385.4	309.7	361.9	307.0	318.2	336.4	0	
226	384.4	309.5	361.2	306.7	317.6	335.9	0	
227	383.0	309.3	360.5	306.2	316.9	335.2	0	
228	381.5	309.1	359.8	305.6	316.2	334.4	0	
229	380.3	309.0	359.2	305.1	315.4	333.8	0	
230	378.9	308.9	358.5	304.6	314.7	333.1	0	
231	377.5	308.7	357.8	304.2	314.0	332.4	0	
232	376.2	308.5	357.2	303.8	313.4	331.8	0	
233	374.7	308.3	356.5	303.5	312.6	331.1	0	
234	373.3	308.1	355.8	302.6	311.6	330.3	0	
235	372.0	307.8	355.1	302.2	310.9	329.6	0	
236	370.5	307.6	354.3	301.9	310.2	328.9	0	
237	369.2	307.2	353.5	301.5	309.5	328.2	0	
238	367.8	307.0	352.8	300.8	308.7	327.4	0	
239	366.6	306.8	351.9	300.2	307.9	326.7	0	

Data from 12/20/22 test - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
240	365.4	306.6	351.2	299.3	307.1	325.9	0
241	364.1	306.4	350.3	298.6	306.4	325.1	0
242	362.9	306.1	349.6	298.1	305.6	324.4	0
243	361.7	305.9	348.7	297.5	304.8	323.7	0
244	360.4	305.6	347.8	296.7	304.0	322.9	0
245	359.2	305.3	347.0	296.0	303.1	322.1	0
246	357.8	305.0	346.1	295.0	302.2	321.2	0
247	356.5	304.7	345.2	294.6	301.4	320.5	0
248	355.2	304.4	344.2	293.7	300.5	319.6	0
249	354.0	304.2	343.4	292.8	299.7	318.8	0
250	352.8	304.0	342.5	292.0	298.9	318.0	0
251	351.6	303.8	341.6	291.1	298.1	317.2	0
252	350.7	303.4	340.8	290.6	297.4	316.6	0
253	349.7	303.2	339.9	289.9	296.8	315.9	0
254	348.7	302.8	339.1	289.0	296.0	315.1	0
255	347.8	302.7	338.3	288.4	295.3	314.5	0
256	346.7	302.3	337.5	287.9	294.6	313.8	0
257	345.7	302.0	336.7	287.2	293.9	313.1	0
258	344.9	301.7	335.9	286.5	293.2	312.4	0
259	343.7	301.5	335.1	285.6	292.6	311.7	0
260	342.5	301.1	334.3	285.1	292.1	311.0	0
261	341.6	300.7	333.6	284.5	291.4	310.4	0
262	340.6	300.5	332.9	283.9	290.9	309.8	0
263	339.6	300.2	332.2	283.0	290.2	309.0	0
264	338.8	299.9	331.4	282.4	289.6	308.4	0
265	337.9	299.5	330.7	281.7	289.1	307.8	0
266	337.0	299.3	330.1	281.0	288.6	307.2	0
267	336.1	298.9	329.4	280.3	288.1	306.6	0
268	335.1	298.6	328.8	279.7	287.4	305.9	0
269	334.3	298.4	328.2	279.2	286.8	305.4	0
270	333.3	298.1	327.6	278.6	286.4	304.8	0
271	332.5	297.9	327.0	278.0	285.8	304.2	0
272	331.5	297.5	326.5	277.4	285.3	303.6	0
273	330.7	297.3	325.9	276.9	284.9	303.1	0
274	329.9	296.9	325.4	276.5	284.5	302.6	0
275	329.1	296.6	324.8	275.9	284.1	302.1	0
276	328.3	296.2	324.3	275.2	283.8	301.6	0
277	327.5	295.9	323.8	274.3	283.3	301.0	0
278	326.8	295.6	323.2	273.8	282.9	300.4	0
279	325.9	295.3	322.7	273.1	282.5	299.9	0
280	325.1	295.0	322.2	272.5	282.0	299.4	0
281	324.3	294.6	321.7	272.0	281.5	298.8	0
282	323.7	294.4	321.2	271.2	281.2	298.4	0
283	323.0	294.0	320.8	270.9	280.8	297.9	0
284	322.0	293.7	320.3	270.1	280.3	297.3	0
285	321.3	293.4	319.9	269.5	279.8	296.8	0
286	320.3	293.1	319.4	268.7	279.3	296.2	0
287	319.5	292.9	318.9	267.9	279.0	295.7	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
288	316.5	293.8	319.0	267.7	278.7	295.1	0
289	315.3	293.5	319.3	266.9	278.4	294.7	0
290	314.6	293.2	318.9	266.6	278.1	294.3	0
291	313.8	292.7	317.9	265.9	277.6	293.6	0
292	313.0	292.3	316.5	265.5	277.2	292.9	0
293	311.9	291.7	314.8	265.1	276.7	292.1	0
294	310.8	291.2	313.0	264.5	276.3	291.2	0
295	309.6	290.6	311.0	264.2	275.8	290.3	0
296	308.1	289.8	309.0	263.8	275.3	289.2	0
297	306.9	289.1	306.9	263.5	274.7	288.2	0
298	305.5	288.3	304.9	262.9	274.0	287.1	0
299	304.0	287.4	302.8	262.5	273.4	286.0	0
300	302.5	286.5	300.8	261.8	272.6	284.9	0
301	301.0	285.5	298.9	261.1	271.7	283.6	0
302	299.4	284.6	296.9	260.5	270.8	282.4	0
303	297.9	283.5	295.1	259.7	269.7	281.2	0
304	296.3	282.4	293.2	258.8	268.7	279.9	0
305	294.6	281.3	291.4	257.7	267.7	278.5	0
306	293.0	280.0	289.6	256.9	266.5	277.2	0
307	291.7	278.7	287.8	255.9	265.4	275.9	0
308	290.1	277.4	286.1	254.9	264.2	274.5	0
309	288.5	276.1	284.4	253.7	263.0	273.2	0
310	287.0	274.8	282.7	252.8	261.8	271.8	0
311	285.5	273.5	281.1	251.9	260.6	270.5	0
312	284.1	272.2	279.5	250.7	259.4	269.2	0
313	282.8	270.9	278.0	249.7	258.2	267.9	0
314	281.2	269.6	276.4	248.7	257.0	266.6	0
315	279.9	268.3	274.8	247.6	255.8	265.3	0
316	278.4	267.0	273.4	246.6	254.6	264.0	0
317	277.2	265.8	272.0	245.6	253.5	262.8	0
318	275.9	264.6	270.5	244.5	252.3	261.6	0
319	274.4	263.4	269.1	243.6	251.1	260.3	0
320	273.1	262.1	267.8	242.4	249.8	259.1	0
321	271.9	260.9	266.4	241.3	248.7	257.9	0
322	270.5	259.6	265.1	240.2	247.6	256.6	0
323	269.2	258.5	263.8	239.0	246.4	255.4	0
324	267.9	257.4	262.6	238.0	245.3	254.2	0
325	266.7	256.2	261.3	237.1	244.1	253.1	0
326	265.5	255.0	260.0	236.1	243.0	251.9	0
327	264.3	253.9	258.8	235.1	241.9	250.8	0
328	263.0	252.8	257.6	234.1	240.8	249.7	0
329	261.8	251.6	256.4	233.2	239.7	248.5	0
330	260.4	250.7	255.3	232.0	238.5	247.4	0
331	259.2	249.6	254.0	231.1	237.5	246.3	0
332	258.0	248.5	252.9	230.1	236.4	245.2	0
333	256.9	247.5	251.7	229.3	235.4	244.2	0
334	255.7	246.5	250.6	228.3	234.4	243.1	0
335	254.4	245.5	249.4	227.5	233.4	242.0	0

Data from 12/20/22 test - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
336	253.2	244.6	248.3	226.6	232.3	241.0	0
337	252.1	243.7	247.2	225.6	231.3	240.0	0
338	250.9	242.6	246.0	224.6	230.3	238.9	0
339	249.7	241.7	245.0	223.6	229.4	237.9	0
340	248.5	240.8	243.8	222.8	228.5	236.9	0
341	247.3	239.9	242.8	221.9	227.5	235.9	0
342	247.2	239.9	242.7	221.8	227.5	235.8	0
Average	491.5	294.6	351.3	315.4	317.7	354	0

Data from 12/2022 testing - Reference only



## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

		Sample ID	Tare, mg		Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0119	187.1		190.0	2.9
	<b>B</b>	H0120	187.6		190.9	3.3
	<b>C - 1st Hour</b>	H0121	188.4		191.5	3.1
	<b>Amb</b>	H0147	91.1		91.3	0.2
<b>Probes</b>	<b>A</b>	12A	116704.8		116704.9	0.1
	<b>B</b>	12B	117771.0		117771.1	0.1
	<b>C - 1st Hour</b>	12C	117171.1		117171.1	0.0
<b>O-rings</b>	<b>A</b>	12A	3586.6		3586.8	0.2
	<b>B</b>	12B	3551.4		3551.4	0.0
	<b>C - 1st Hour</b>	12C	3617.5		3617.6	0.1

**Placed in Dessicator on:**

<b>Filters</b>	<b>A</b>	189.9	12/19 8:12	190.0	12/31 11:58	190.0	1/3 9:40		
	<b>B</b>	191.3	12/19 8:12	190.9	12/31 11:59	190.9	1/3 9:41		
	<b>C - 1st Hour</b>	191.6	12/19 8:12	191.5	12/31 11:59	191.5	1/3 9:41		
	<b>Amb</b>	91.1	12/19 8:12	91.4	12/31 12:12	91.3	1/3 9:41		
<b>Probes</b>	<b>A</b>			116705.0	12/31 12:11	116704.9	1/3 9:41		
	<b>B</b>			117771.2	12/31 12:11	117771.1	1/3 9:41		
	<b>C - 1st Hour</b>			117171.1	12/31 12:11	117171.1	1/3 9:41		
<b>O-Rings</b>	<b>A</b>			3586.9	12/31 11:58	3586.8	1/3 9:41		
	<b>B</b>			3551.4	12/31 11:58	3551.4	1/3 9:41		
	<b>C - 1st Hour</b>			3617.6	12/31 11:58	3617.6	1/3 9:41		

<b>Train A Aggregate, mg:</b>	<b>3.2</b>
<b>Train B Aggregate, mg:</b>	<b>3.4</b>
<b>Train C Aggregate, mg:</b>	<b>3.2</b>
<b>Ambient Aggregate, mg:</b>	<b>0.2</b>

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 3 Data Summary**

Client: SBI  
Model: J.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/20/2022

*Data from 12/20/2022 testing - reference only*

  
\_\_\_\_\_  
Technician Signature

7/12/2023  
\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBIModel: 1.7RRun #: 3Job #: 22-835Tracking #: 135Technician: AKDate: 12/20/2022

<b>Burn Rate (kg/hr):</b>	<b>4.33</b>
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	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	20.846	15.825	15.852	10.143
Average Gas Velocity in Dilution Tunnel (ft/sec)	23.44			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	26579.4			
Average Gas Meter Temperature (°F)	79.6	72.1	71.3	72.0
Total Sample Volume (dscf)	20.506	15.987	15.976	10.009
Average Tunnel Temperature (°F)	110.5			
Total Time of Test (min)	94			
Total Particulate Catch (mg)	0.1	2.6	2.7	2.4
Particulate Concentration, dry-standard (g/dscf)	0.0000049	0.0001626	0.0001690	0.0002398
Total PM Emissions (g)	0.20	6.57	6.83	6.24
Particulate Emission Rate (g/hr)	0.13	4.19	4.36	6.24
Emissions Factor (g/kg)	-	0.98	1.02	-
Difference from Average Total Particulate Emissions (g)	-	0.13	0.13	-
Difference from Average Total Particulate Emissions (%)	-	2.0%	2.0%	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	6.70
Particulate Emission Rate (g/hr)	4.28
Emissions Factor (g/kg)	1.00
HHV Efficiency (%)	69.5%
LHV Efficiency (%)	74.5%
CO Emissions (g/min)	3.40

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 81.9/Max: 87.8	OK
Face Velocity	< 30 ft/min	9.2	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:70.4/Max:86.2	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/20/22  
**Run:** 3  
**Control #:** 22-835  
**Test Duration:** 67  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	69.5%	74.5%
<b>Combustion Efficiency</b>	96.6%	96.6%
<b>Heat Transfer Efficiency</b>	72.0%	77.1%

<b>Output Rate (kJ/h)</b>	57,869	54,895	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	4.43	9.76	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	83,212	78,935	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	4.94	10.89	<b>dry lb</b>
<b>MC wet (%)</b>	16.62		
<b>MC dry (%)</b>	19.93		
<b>Particulate (g)</b>	6.70		
<b>CO (g)</b>	228		
<b>Test Duration (h)</b>	1.12		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.10	3.52
<b>g/kg Dry Fuel</b>	1.36	46.09
<b>g/h</b>	6.00	203.98
<b>g/min</b>	0.10	3.40
<b>lb/MM Btu Output</b>	0.24	8.19

<b>Air/Fuel Ratio (A/F)</b>	8.07
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VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/20/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.89  
 Max Allowable Start-up Fuel Weight (lbs): 4.33

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	16.00	3.06	In Range	26.8	17.9	18.9	21.2	In Range	2.53	1.15	
2	15.83	2.87	In Range	22.0	18.4	18.1	19.5	In Range	2.40	1.09	
3	15.75	2.45	In Range	26.6	16.8	18.3	20.6	In Range	2.03	0.92	
Core Load Wt. (lbs)		8.38	In Range								

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	16.00	2.38	In Range	27.0	14.3	14.2	18.5	In Range	2.01	0.91	
2	16.00	3.67	In Range	28.1	16.2	14.9	19.7	In Range	3.06	1.39	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.05	In Range								

Total Load Weight (lbs): 14.43 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: 100% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.0  
 Total Load Average Moisture Content (%DB): 19.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.6  
 Total Test Load Weight (dry basis): 12.03 lbs 5.46 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
		1	2	3				lbs	kg
2.84	In Range	10	10	10	10.0	In Range	2.58	1.17	

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
		1	2	3				lbs	kg
4.19	In Range	24.6	18.8	19.9	21.1	In Range	3.46	1.57	

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.4 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 1.97 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.3 to 1.59 lb  
 Actual Fuel Load Ending Weight (lb): 1.37 In Range

Total Weight All Fuel Added: 21.46 lbs, wet basis      Total Weight All Fuel Burned (dry basis): 14.74 lbs  
 18.08 lbs, dry basis      6.68 kg  
 8.20 kg, dry basis

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3  
 Test Start Time: 10:42  
 Test Type: High Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 94  
 High Fire Test Load Time (min): 27

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.80	29.78	29.79
Relative Humidity (%)	26.7	26.4	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	20.846 ft <sup>3</sup>		

**Sample Train Post-Test Leak Checks**

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

### DILUTION TUNNEL FLOW

#### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.117	70
2	0.143	70
3	0.137	70
4	0.124	70
5	0.085	70
6	0.127	70
7	0.137	70
8	0.125	70
Center	0.145	70

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

$V_{strav}$ : 23.41 ft/sec  
 $V_{scent}$ : 25.34 ft/sec  
 $F_p$ : 0.924 [ratio]  
 Initial Tunnel Flow: 476.4 scf/min

Static Pressure: -0.290 in. H<sub>2</sub>O

### 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 3

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/20/2022

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

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.144	0.00	71.7	0.21		7.11		75.3	119.9	86.9	70.4
1			0.144	0.00	71.7	0.24	-	6.98	-0.12	76.3	181.5	86.7	70.4
2			0.144	0.00	71.8	0.25	-	6.83	-0.16	76.6	266.2	85.5	70.5
3			0.144	0.00	71.7	0.25	-	6.67	-0.16	78.6	337.4	84.4	70.5
4			0.143	0.00	71.8	0.28	-	6.48	-0.19	81.1	397.5	83.6	70.4
5			0.142	0.00	71.8	0.30	-	6.25	-0.23	83.9	454.4	82.8	70.4
6			0.142	0.00	71.8	0.33	-	6.01	-0.24	86.2	496.8	82.2	70.5
7			0.138	0.00	71.9	0.35	-	5.82	-0.19	87.2	508.2	82.2	70.7
8			0.139	0.00	71.9	0.36	-	5.61	-0.21	88.8	525.5	82.7	70.9
9			0.140	0.00	71.9	0.37	-	5.40	-0.21	90.2	539.1	83.2	70.8
10	1.698	0.170	0.140	0.00	72.0	0.36	96	5.20	-0.21	91.1	547.4	83.6	71.1
11			0.137	0.00	72.0	0.38	-	5.02	-0.18	91.5	542.4	84.1	71.3
12			0.138	0.00	72.0	0.38	-	4.81	-0.20	92.3	548.2	84.3	71.8
13			0.139	0.00	71.9	0.39	-	4.59	-0.23	94.2	568.2	84.6	72.2
14			0.139	0.00	72.0	0.38	-	4.39	-0.20	95.0	569.7	85.0	72.6
15			0.137	0.00	71.9	0.40	-	4.15	-0.24	96.9	588.4	85.3	72.9
16			0.138	0.00	71.9	0.38	-	3.90	-0.24	98.3	604.0	85.8	73.2
17			0.138	0.00	71.9	0.40	-	3.66	-0.25	99.5	612.9	86.1	73.5
18			0.138	0.00	71.9	0.42	-	3.43	-0.23	100.4	613.7	86.6	73.5
19			0.137	0.00	71.9	0.41	-	3.23	-0.21	100.3	609.7	87.0	74.4
20	3.393	0.169	0.135	0.00	71.9	0.41	99	3.02	-0.20	100.5	606.7	87.6	74.5
21			0.136	0.00	71.9	0.42	-	2.83	-0.19	100.8	602.3	86.7	74.9
22			0.134	0.00	72.0	0.41	-	2.64	-0.19	101.0	597.6	85.9	75.0
23			0.136	0.00	72.0	0.42	-	2.46	-0.18	101.0	593.5	85.4	75.5
24			0.138	0.00	72.0	0.42	-	2.31	-0.16	101.3	591.4	84.9	75.5
25			0.137	0.00	72.0	0.43	-	2.15	-0.16	99.6	593.5	84.5	75.9
26			0.137	0.00	72.0	0.41	-	1.97	-0.18	98.4	596.4	84.1	76.8
27			0.128	0.00	71.9	0.45	-	14.43	12.46	133.7	615.6	84.2	77.8
28			0.132	0.00	71.9	0.45	-	14.02	-0.41	118.7	584.1	84.0	79.4
29			0.135	0.00	71.9	0.45	-	13.78	-0.25	108.4	591.2	83.5	78.9
30	5.095	0.170	0.135	0.00	71.9	0.45	101	13.58	-0.20	107.2	595.0	82.9	78.0
31			0.134	0.00	72.0	0.45	-	13.39	-0.18	106.6	590.7	82.9	78.1
32			0.136	0.00	72.0	0.45	-	13.21	-0.19	106.1	588.4	82.7	78.1



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.136	0.00	72.1	0.45	-	13.03	-0.17	106.1	585.3	82.6	78.4
34			0.136	0.00	72.2	0.45	-	12.83	-0.21	106.5	589.3	82.5	78.7
35			0.136	0.00	72.2	0.44	-	12.65	-0.18	106.8	588.1	82.5	78.3
36			0.136	0.00	72.2	0.45	-	12.46	-0.19	106.9	586.5	82.3	78.8
37			0.136	0.00	72.2	0.43	-	12.27	-0.19	106.9	584.7	82.1	78.9
38			0.136	0.00	72.2	0.44	-	12.09	-0.19	107.2	586.1	81.9	79.0
39			0.135	0.00	72.2	0.43	-	11.90	-0.19	107.6	588.1	82.2	79.1
40	6.786	0.169	0.136	0.00	72.3	0.43	100	11.72	-0.19	107.9	588.8	82.4	79.3
41			0.134	0.00	72.3	0.44	-	11.51	-0.20	108.4	593.6	82.6	79.5
42			0.136	0.00	72.2	0.45	-	11.32	-0.20	108.9	599.8	82.9	79.8
43			0.135	0.00	72.2	0.44	-	11.10	-0.22	109.7	610.3	83.1	80.1
44			0.134	0.00	72.1	0.44	-	10.88	-0.22	111.0	624.8	83.4	79.7
45			0.133	0.00	72.1	0.46	-	10.65	-0.23	112.2	639.4	83.7	80.0
46			0.132	0.00	72.1	0.44	-	10.40	-0.25	113.6	656.2	84.2	80.5
47			0.132	0.00	72.0	0.44	-	10.14	-0.26	115.0	672.3	84.4	80.6
48			0.132	0.00	72.0	0.44	-	9.88	-0.26	116.4	689.6	84.6	80.7
49			0.134	0.00	72.0	0.45	-	9.61	-0.27	117.8	706.0	84.9	81.3
50	8.476	0.169	0.133	0.00	72.1	0.45	101	9.33	-0.28	119.1	724.8	85.2	81.6
51			0.134	0.00	72.1	0.46	-	9.07	-0.26	120.5	739.6	85.3	81.6
52			0.133	0.00	72.2	0.47	-	8.80	-0.27	121.8	750.7	85.7	82.1
53			0.133	0.00	72.1	0.48	-	8.50	-0.30	122.7	759.2	86.0	82.1
54			0.133	0.00	72.1	0.49	-	8.21	-0.29	123.9	763.7	86.1	82.4
55			0.133	0.00	72.1	0.50	-	7.92	-0.29	124.9	762.7	86.0	82.5
56			0.133	0.00	72.2	0.51	-	7.62	-0.29	124.8	761.5	85.9	83.0
57			0.130	0.00	72.1	0.51	-	7.33	-0.30	125.7	761.4	86.0	83.0
58			0.129	0.00	72.1	0.53	-	7.05	-0.28	126.2	762.8	86.0	83.1
59			0.128	0.00	72.2	0.52	-	6.75	-0.30	127.0	765.5	86.3	83.6
60	10.143	0.167	0.129	0.00	72.1	0.56	102	6.49	-0.27	127.1	766.1	86.4	83.8
61			0.131	0.00	72.1	0.57	-	6.22	-0.27	127.6	767.6	86.6	84.3
62			0.130	0.00	72.1	0.59	-	5.93	-0.29	127.9	769.9	86.6	84.7
63			0.131	0.00	72.1	0.59	-	5.68	-0.25	128.2	773.2	86.9	84.5
64			0.131	0.00	72.2	0.59	-	5.40	-0.28	128.8	773.8	86.8	85.1
65			0.131	0.00	72.3	0.61	-	5.14	-0.26	128.8	773.7	86.4	85.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.130	0.00	72.4	0.62	-	4.89	-0.26	128.8	772.6	86.3	85.6
67			0.130	0.00	72.4	0.63	-	4.64	-0.25	129.3	772.5	86.0	85.9
68			0.132	0.00	72.5	0.64	-	4.39	-0.25	129.3	772.7	85.8	86.0
69			0.130	0.00	72.5	0.63	-	4.17	-0.22	129.3	774.5	85.5	83.9
70	11.804	0.166	0.131	0.00	72.5	0.64	102	3.98	-0.19	127.0	777.3	85.3	81.0
71			0.132	0.00	72.4	0.66	-	3.81	-0.17	125.7	778.6	85.0	81.9
72			0.131	0.00	72.4	0.66	-	3.60	-0.22	125.1	780.3	84.8	81.6
73			0.131	0.00	72.3	0.66	-	3.39	-0.20	124.2	775.0	84.6	83.0
74			0.134	0.00	72.3	0.66	-	3.22	-0.17	123.3	763.8	84.5	81.6
75			0.133	0.00	72.3	0.66	-	3.07	-0.15	122.2	747.1	84.4	81.3
76			0.132	0.00	72.4	0.67	-	2.90	-0.17	120.8	728.0	84.2	82.7
77			0.133	0.00	72.3	0.66	-	2.75	-0.15	119.5	706.3	83.9	82.5
78			0.134	0.00	72.3	0.67	-	2.63	-0.12	117.7	684.1	83.7	81.4
79			0.133	0.00	72.3	0.67	-	2.50	-0.12	116.4	662.3	83.6	83.0
80	13.468	0.166	0.133	0.00	72.4	0.68	101	2.40	-0.11	117.2	642.9	83.5	84.6
81			0.134	0.00	72.4	0.67	-	2.29	-0.11	117.0	626.4	83.5	84.8
82			0.135	0.00	72.4	0.67	-	2.19	-0.10	116.9	612.6	83.4	85.0
83			0.135	0.00	72.4	0.68	-	2.10	-0.09	116.4	600.7	83.2	85.1
84			0.135	0.00	72.4	0.68	-	2.02	-0.08	115.7	591.8	83.1	85.7
85			0.134	0.00	72.4	0.67	-	1.93	-0.10	115.3	583.1	82.9	85.4
86			0.137	0.00	72.5	0.69	-	1.85	-0.07	115.0	576.0	82.7	85.7
87			0.136	0.00	72.5	0.67	-	1.78	-0.08	114.4	569.6	82.6	85.5
88			0.137	0.00	72.4	0.67	-	1.70	-0.07	114.0	563.2	82.4	86.0
89			0.136	0.00	72.4	0.67	-	1.64	-0.07	113.4	556.5	82.2	85.8
90	15.137	0.167	0.137	0.00	72.4	0.67	99	1.57	-0.06	112.9	550.5	82.0	85.6
91			0.136	0.00	72.4	0.67	-	1.51	-0.06	112.5	545.0	82.1	86.2
92			0.138	0.00	72.5	0.68	-	1.44	-0.07	111.8	539.4	82.5	84.4
93			0.136	0.00	72.5	0.68	-	1.38	-0.06	111.2	534.7	83.0	85.4
94	15.825	0.172	0.136	0.00	72.5	0.67	103	1.37	-0.01	111.2	534.2	83.1	85.8
Avg/Tot	15.825	0.169	0.135	0.00	72.1	0.50	100			110.5	622.8	84.3	79.6

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	70.8	0.47		87.8	-0.042	1.74	0.028	28.3	35.2
1			0.00	70.8	0.50	-	87.4	-0.054	2.17	0.033	30.5	41.2
2			0.00	70.8	0.52	-	85.6	-0.070	7.90	0.104	28.9	41.7
3			0.00	70.8	0.51	-	85.0	-0.077	9.54	0.245	33.7	45.0
4			0.00	70.9	0.53	-	84.5	-0.084	10.74	0.342	34.8	47.5
5			0.00	70.9	0.50	-	83.9	-0.090	11.79	0.777	35.1	49.8
6			0.00	70.9	0.60	-	83.7	-0.093	13.19	1.283	35.3	52.3
7			0.00	71.0	0.50	-	83.7	-0.091	12.84	0.307	34.4	54.0
8			0.00	71.0	0.62	-	83.6	-0.094	12.36	0.311	31.9	52.7
9			0.00	71.0	0.52	-	83.4	-0.095	12.86	0.214	31.2	53.4
10	1.707	0.171	0.00	71.1	0.55	96	83.4	-0.095	13.55	0.167	30.4	54.0
11			0.00	71.1	0.58	-	83.3	-0.095	11.94	0.107	29.5	54.0
12			0.00	71.1	0.58	-	83.3	-0.096	12.33	0.118	28.1	52.9
13			0.00	71.1	0.54	-	83.3	-0.097	14.66	0.222	27.8	53.2
14			0.00	71.1	0.57	-	83.2	-0.099	13.13	0.049	27.9	55.2
15			0.00	71.1	0.63	-	83.3	-0.098	15.15	0.176	27.0	54.9
16			0.00	71.1	0.55	-	83.5	-0.102	15.98	0.391	27.5	57.0
17			0.00	71.1	0.51	-	83.4	-0.102	16.29	0.490	27.0	57.6
18			0.00	71.1	0.64	-	83.5	-0.102	15.89	0.301	26.2	57.7
19			0.00	71.1	0.67	-	83.6	-0.100	15.25	0.221	25.0	57.4
20	3.398	0.169	0.00	71.1	0.59	98	83.8	-0.101	14.69	0.129	24.5	56.8
21			0.00	71.1	0.67	-	83.6	-0.099	14.25	0.150	24.0	56.3
22			0.00	71.2	0.64	-	83.6	-0.099	13.63	0.150	23.2	55.8
23			0.00	71.2	0.65	-	83.4	-0.099	13.40	0.092	22.5	55.0
24			0.00	71.2	0.64	-	83.3	-0.098	13.34	0.101	21.8	54.3
25			0.00	71.2	0.58	-	83.3	-0.100	13.21	0.128	21.5	54.1
26			0.00	71.2	0.58	-	83.4	-0.100	13.84	0.118	22.4	53.2
27			0.00	71.1	0.64	-	83.1	-0.108	7.73	0.085	22.4	53.1
28			0.00	71.1	0.63	-	82.9	-0.099	5.01	0.110	14.2	59.7
29			0.00	71.1	0.62	-	82.7	-0.101	13.65	0.108	15.2	57.2
30	5.096	0.170	0.00	71.1	0.62	100	82.9	-0.102	13.64	0.105	21.1	59.4
31			0.00	71.2	0.65	-	83.5	-0.100	12.54	0.075	21.3	59.2
32			0.00	71.2	0.68	-	84.3	-0.099	12.13	0.139	21.1	58.1
33			0.00	71.3	0.62	-	84.8	-0.100	11.74	0.068	21.1	57.7
34			0.00	71.3	0.70	-	85.5	-0.100	12.89	0.050	21.0	57.4
35			0.00	71.4	0.69	-	86.0	-0.100	12.61	0.062	21.1	57.9
36			0.00	71.4	0.67	-	86.6	-0.100	12.19	0.081	20.9	57.7
37			0.00	71.4	0.64	-	87.1	-0.100	11.94	0.073	20.5	57.4
38			0.00	71.4	0.62	-	86.8	-0.100	12.27	0.067	20.4	57.2

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	71.4	0.62	-	86.5	-0.101	12.46	0.075	20.3	57.4
40	6.797	0.170	0.00	71.4	0.63	100	86.2	-0.100	12.34	0.073	20.2	57.6
41			0.00	71.4	0.68	-	85.9	-0.101	12.83	0.098	20.2	57.7
42			0.00	71.4	0.69	-	85.6	-0.102	13.27	0.090	20.3	58.1
43			0.00	71.4	0.69	-	85.4	-0.104	13.92	0.147	20.2	58.6
44			0.00	71.3	0.62	-	85.2	-0.105	14.66	0.207	20.3	59.2
45			0.00	71.3	0.69	-	84.8	-0.106	15.28	0.342	20.2	60.1
46			0.00	71.3	0.67	-	84.5	-0.109	15.75	0.491	20.1	60.8
47			0.00	71.3	0.62	-	84.2	-0.109	16.03	0.759	19.8	61.7
48			0.00	71.3	0.62	-	83.9	-0.109	16.27	1.010	19.6	62.4
49			0.00	71.3	0.61	-	83.7	-0.109	16.48	1.125	19.3	63.0
50	8.491	0.169	0.00	71.3	0.65	101	83.5	-0.109	16.94	1.276	18.8	63.5
51			0.00	71.4	0.66	-	83.3	-0.109	17.16	1.317	18.5	64.2
52			0.00	71.4	0.65	-	83.1	-0.109	17.65	1.281	18.1	64.8
53			0.00	71.3	0.62	-	83.1	-0.109	18.16	1.334	17.8	65.1
54			0.00	71.3	0.66	-	83.0	-0.109	18.42	1.566	17.7	65.7
55			0.00	71.4	0.65	-	83.1	-0.109	18.50	1.691	17.3	65.5
56			0.00	71.3	0.61	-	83.0	-0.109	18.57	1.705	17.0	64.9
57			0.00	71.3	0.73	-	83.0	-0.109	18.62	1.674	16.9	64.8
58			0.00	71.4	0.69	-	82.8	-0.109	18.65	1.601	16.8	64.4
59			0.00	71.4	0.74	-	82.8	-0.109	18.75	1.501	16.5	64.0
60	10.165	0.167	0.00	71.4	0.73	102	82.6	-0.109	18.77	1.422	16.3	63.7
61			0.00	71.3	0.78	-	82.5	-0.109	18.75	1.401	16.0	63.1
62			0.00	71.3	0.80	-	82.5	-0.109	18.76	1.356	15.8	62.8
63			0.00	71.3	0.76	-	82.5	-0.109	18.83	1.311	15.6	62.4
64			0.00	71.4	0.80	-	82.8	-0.109	18.93	1.350	15.4	62.1
65			0.00	71.5	0.82	-	82.8	-0.109	18.94	1.326	15.2	61.7
66			0.00	71.5	0.79	-	83.1	-0.109	19.02	1.247	15.0	61.3
67			0.00	71.6	0.85	-	83.1	-0.109	18.92	1.344	14.8	61.0
68			0.00	71.6	0.80	-	83.3	-0.109	18.84	1.298	14.7	60.6
69			0.00	71.6	0.83	-	83.3	-0.109	18.73	1.206	14.4	60.1
70	11.830	0.166	0.00	71.6	0.89	102	83.3	-0.109	18.52	1.164	14.3	60.1
71			0.00	71.6	0.83	-	83.3	-0.109	18.42	1.212	14.7	60.8
72			0.00	71.5	0.86	-	83.3	-0.109	18.40	1.040	15.0	61.2
73			0.00	71.5	0.85	-	83.5	-0.109	18.14	0.901	15.0	61.2
74			0.00	71.5	0.89	-	83.5	-0.109	17.71	0.781	15.0	61.3
75			0.00	71.5	0.90	-	83.4	-0.109	17.10	0.740	14.9	61.2
76			0.00	71.5	0.85	-	83.4	-0.109	16.52	0.598	14.8	60.6
77			0.00	71.5	0.90	-	83.5	-0.107	15.83	0.409	14.8	59.7

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	71.4	0.83	-	83.5	-0.104	13.96	0.172	14.6	58.5
79			0.00	71.4	0.90	-	83.5	-0.103	12.75	0.061	14.4	56.5
80	13.499	0.167	0.00	71.5	0.83	101	83.5	-0.101	11.92	0.023	14.4	55.4
81			0.00	71.5	0.85	-	83.5	-0.099	11.19	0.000	13.7	54.5
82			0.00	71.5	0.89	-	83.4	-0.098	10.84	0.000	13.3	53.6
83			0.00	71.5	0.89	-	83.4	-0.097	10.67	0.000	13.1	52.9
84			0.00	71.6	0.90	-	83.2	-0.096	10.67	0.000	12.9	52.3
85			0.00	71.6	0.82	-	83.1	-0.096	10.56	0.000	12.9	51.8
86			0.00	71.7	0.88	-	83.1	-0.094	10.46	0.000	12.8	51.4
87			0.00	71.7	0.88	-	83.1	-0.094	10.33	0.000	12.8	50.9
88			0.00	71.6	0.84	-	83.1	-0.093	10.23	0.000	12.7	50.4
89			0.00	71.6	0.91	-	83.1	-0.092	10.10	0.000	12.7	50.0
90	15.169	0.167	0.00	71.7	0.88	99	83.1	-0.092	9.84	0.000	12.7	49.6
91			0.00	71.7	0.85	-	83.0	-0.092	9.55	0.000	12.7	49.3
92			0.00	71.7	0.84	-	82.9	-0.092	9.40	0.000	12.7	48.9
93			0.00	71.7	0.87	-	82.9	-0.091	9.34	0.000	12.8	48.6
94	15.852	0.171	0.00	71.7	0.85	101	82.9	-0.091	9.33	0.000	12.8	48.2
Avg/Tot	15.852	0.169	0.00	71.3	0.87	100	83.8	-0.100	13.95	0.500	19.84	56.701

Data from 12/20/22 testing - Reference only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	71.7	0.21		86.9
1			0.00	71.7	0.24	-	86.7
2			0.00	71.8	0.25	-	85.5
3			0.00	71.7	0.25	-	84.4
4			0.00	71.8	0.28	-	83.6
5			0.00	71.8	0.30	-	82.8
6			0.00	71.8	0.33	-	82.2
7			0.00	71.9	0.35	-	82.2
8			0.00	71.9	0.36	-	82.7
9			0.00	71.9	0.37	-	83.2
10	1.698	0.170	0.00	72.0	0.36	96	83.6
11			0.00	72.0	0.38	-	84.1
12			0.00	72.0	0.38	-	84.3
13			0.00	71.9	0.39	-	84.6
14			0.00	72.0	0.38	-	85.0
15			0.00	71.9	0.40	-	85.3
16			0.00	71.9	0.38	-	85.8
17			0.00	71.9	0.40	-	86.1
18			0.00	71.9	0.42	-	86.6
19			0.00	71.9	0.41	-	87.0
20	3.393	0.169	0.00	71.9	0.41	98	87.6
21			0.00	71.9	0.42	-	86.7
22			0.00	72.0	0.41	-	85.9
23			0.00	72.0	0.42	-	85.4
24			0.00	72.0	0.42	-	84.9
25			0.00	72.0	0.43	-	84.5
26			0.00	72.0	0.41	-	84.1
27			0.00	71.9	0.45	-	84.2
28			0.00	71.9	0.45	-	84.0
29			0.00	71.9	0.45	-	83.5
30	5.095	0.170	0.00	71.9	0.45	100	82.9
31			0.00	72.0	0.45	-	82.9

Data from 12/20/2022 testing - Reference only

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 22-835

Model: 1.7R

Tracking #: 135

Run #: 3

Technician: AK

Date: 12/20/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	72.0	0.45	-	82.7
33			0.00	72.1	0.45	-	82.6
34			0.00	72.2	0.45	-	82.5
35			0.00	72.2	0.44	-	82.5
36			0.00	72.2	0.45	-	82.3
37			0.00	72.2	0.43	-	82.1
38			0.00	72.2	0.44	-	81.9
39			0.00	72.2	0.43	-	82.2
40	6.786	0.169	0.00	72.3	0.43	99	82.4
41			0.00	72.3	0.44	-	82.6
42			0.00	72.2	0.45	-	82.9
43			0.00	72.2	0.44	-	83.1
44			0.00	72.1	0.44	-	83.4
45			0.00	72.1	0.46	-	83.7
46			0.00	72.1	0.44	-	84.2
47			0.00	72.0	0.44	-	84.4
48			0.00	72.0	0.44	-	84.6
49			0.00	72.0	0.45	-	84.9
50	8.476	0.169	0.00	72.1	0.45	100	85.2
51			0.00	72.1	0.46	-	85.3
52			0.00	72.2	0.47	-	85.7
53			0.00	72.1	0.48	-	86.0
54			0.00	72.1	0.49	-	86.1
55			0.00	72.1	0.50	-	86.0
56			0.00	72.2	0.51	-	85.9
57			0.00	72.1	0.51	-	86.0
58			0.00	72.1	0.53	-	86.0
59			0.00	72.2	0.52	-	86.3
60	10.143	0.167	0.00	72.1	0.56	101	86.4
Avg/Tot	10.143	0.169	0.00	72.0	0.42	99	84.4

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	83.3	70.7	71.0	71.0	70.7	73.4	0
1	117.2	70.7	71.9	71.0	70.7	80.3	0
2	163.9	70.7	74.5	71.2	71.0	90.2	0
3	229.2	70.6	78.7	71.8	71.5	104.4	0
4	299.1	70.6	84.7	72.8	72.4	119.9	0
5	365.4	70.7	92.1	74.3	73.9	135.3	0
6	429.7	70.8	100.6	76.5	75.9	150.7	0
7	485.9	71.0	109.9	79.4	78.5	164.9	0
8	535.2	71.4	119.1	83.0	81.7	178.1	0
9	574.6	71.9	127.6	87.6	85.4	189.4	0
10	607.1	72.7	135.6	93.1	89.7	199.7	0
11	625.1	73.9	143.4	99.7	94.5	207.3	0
12	636.5	75.4	150.9	107.0	99.9	213.9	0
13	659.2	77.4	158.2	114.8	105.9	223.1	0
14	680.5	79.7	165.7	122.5	112.3	232.2	0
15	697.9	82.5	173.4	130.0	119.0	240.6	0
16	713.6	85.7	181.4	136.9	126.2	248.7	0
17	727.8	89.2	189.6	143.0	133.8	256.7	0
18	740.7	93.1	197.9	148.7	141.9	264.4	0
19	753.1	97.3	206.7	154.3	150.4	272.3	0
20	763.1	101.9	215.8	161.2	159.1	280.2	0
21	771.6	107.0	225.2	168.6	167.4	287.9	0
22	778.7	112.4	234.4	177.0	175.3	295.6	0
23	784.2	118.1	243.6	185.5	183.5	303.0	0
24	790.0	124.0	253.0	193.9	192.2	310.6	0
25	794.8	130.3	262.2	202.4	201.3	318.2	0
26	801.8	136.8	271.6	210.7	210.3	326.3	0
27	796.7	144.3	282.7	219.2	219.6	332.5	0
28	770.3	151.9	295.4	227.4	228.7	334.7	0
29	759.2	158.8	303.0	235.3	237.3	338.7	0
30	757.5	165.5	305.6	243.1	245.3	343.4	0
31	754.4	172.0	305.6	250.5	252.5	347.0	0
32	750.0	178.3	304.4	257.4	259.1	349.8	0
33	744.8	184.2	302.8	263.7	265.1	352.1	0
34	742.6	189.7	301.0	269.3	270.5	354.6	0
35	739.7	194.8	299.7	274.3	275.2	356.7	0
36	735.9	199.5	298.8	278.7	279.5	358.5	0
37	731.6	203.9	298.1	282.7	283.3	359.9	0
38	728.8	208.1	297.6	286.2	286.8	361.5	0
39	727.2	212.0	297.5	289.4	289.8	363.2	0
40	725.7	215.6	297.5	292.3	292.7	364.8	0
41	725.8	219.0	297.8	295.1	295.3	366.6	0
42	727.1	222.2	298.4	297.7	297.8	368.6	0
43	731.3	225.2	299.3	300.0	300.3	371.2	0
44	738.4	228.1	300.5	302.4	302.7	374.4	0
45	747.3	230.9	302.0	304.6	304.9	377.9	0
46	757.4	233.6	303.8	306.9	307.2	381.8	0
47	768.1	236.3	306.0	309.3	309.6	385.9	0



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	778.8	238.9	308.6	311.8	312.0	390.0	0
49	789.2	241.6	311.4	314.4	314.5	394.2	0
50	800.3	244.2	314.5	317.0	317.1	398.6	0
51	811.7	246.8	317.9	319.8	319.8	403.2	0
52	823.2	249.6	321.6	322.8	322.6	408.0	0
53	834.9	252.3	325.8	325.7	325.4	412.8	0
54	847.4	255.2	330.5	328.9	328.2	418.1	0
55	859.5	258.0	335.9	332.1	331.1	423.3	0
56	870.5	261.0	341.7	335.6	334.1	428.6	0
57	880.8	264.2	348.1	339.3	337.3	433.9	0
58	890.2	267.6	354.6	343.0	340.6	439.2	0
59	899.2	271.0	361.3	346.8	343.8	444.5	0
60	906.6	274.5	368.0	350.8	347.1	449.4	0
61	913.0	278.1	374.5	355.0	350.6	454.2	0
62	918.1	281.9	381.1	359.0	354.2	458.8	0
63	921.7	285.7	387.5	363.2	357.7	463.2	0
64	925.7	289.6	394.1	367.4	361.2	467.6	0
65	929.2	293.6	401.0	371.4	364.7	472.0	0
66	933.5	297.6	408.4	375.6	368.0	476.6	0
67	937.3	301.9	416.4	379.7	371.4	481.3	0
68	939.6	306.2	424.9	383.6	374.8	485.8	0
69	940.3	310.2	433.0	386.7	378.3	489.9	0
70	939.4	313.4	443.6	389.5	381.8	493.5	0
71	937.5	316.5	453.6	392.3	385.2	497.0	0
72	935.3	320.3	464.2	394.9	388.8	500.7	0
73	932.6	324.2	475.5	397.5	392.1	504.4	0
74	929.4	328.2	487.3	400.9	395.6	508.3	0
75	924.9	332.4	499.2	403.6	399.4	511.9	0
76	920.0	336.5	511.1	406.6	402.9	515.4	0
77	912.8	340.9	522.7	409.6	406.4	518.5	0
78	902.3	345.4	533.7	412.4	410.0	520.7	0
79	890.0	350.3	543.1	415.9	413.3	522.5	0
80	875.7	355.3	551.1	419.5	416.6	523.6	0
81	860.0	360.2	557.5	422.7	419.7	524.0	0
82	844.0	365.3	562.8	425.7	422.6	524.1	0
83	828.3	370.4	567.1	428.3	425.5	523.9	0
84	814.4	375.5	570.8	430.6	427.9	523.9	0
85	801.3	380.5	573.8	432.4	429.9	523.6	0
86	790.1	385.6	576.1	434.1	431.7	523.5	0
87	780.5	390.4	578.0	435.2	433.0	523.4	0
88	771.9	395.4	579.6	436.0	434.3	523.4	0
89	764.4	400.2	580.9	436.5	435.3	523.5	0
90	756.5	405.0	582.0	437.0	436.2	523.3	0
91	748.2	409.7	582.5	436.9	436.7	522.8	0
92	740.4	414.6	582.4	437.1	437.3	522.4	0
93	732.3	419.7	581.5	437.2	437.3	521.6	0
94	731.7	420.1	581.4	437.2	437.3	521.5	0
Average	754.6	228.1	338.3	286.7	284.3	378	0

Data from 12/20/22 testing - Reference only

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0122	188.3	190.9	2.6
	<b>B</b>	H0123	188.7	191.4	2.7
	<b>C - 1st Hour</b>	H0124	188.5	190.8	2.3
	<b>Amb</b>	H0148	89.8	89.9	0.1
<b>Probes</b>	<b>A</b>	13A	117314.3	117314.3	0.0
	<b>B</b>	13B	116940.6	116940.6	0.0
	<b>C - 1st Hour</b>	13C	115649.8	115649.9	0.1
<b>O-rings</b>	<b>A</b>	13A	3596.6	3596.6	0.0
	<b>B</b>	13B	3643.1	3643.0	0.0*
	<b>C - 1st Hour</b>	13C	4409.8	4409.8	0.0

\*Negative value corrected to zero

**Placed in Dessicator on:** 12/26/2022

<b>Filters</b>	<b>A</b>	191.2	12/20 2:07	191.0	12/31 11:59	190.9	1/3 9:42		
	<b>B</b>	191.7	12/20 2:07	191.3	12/31 11:59	191.4	1/3 9:42		
	<b>C - 1st Hour</b>	191.2	12/20 2:07	190.9	12/31 11:59	190.8	1/3 9:42		
	<b>Amb</b>	89.8	12/20 2:07	89.9	12/31 12:12	89.9	1/3 9:42		
<b>Probes</b>	<b>A</b>			117314.6	12/31 12:10	117314.3	1/3 9:42	117314.3	1/4 12:20
	<b>B</b>			116940.7	12/31 12:10	116940.6	1/3 9:42		
	<b>C - 1st Hour</b>			115650.0	12/31 12:10	115649.9	1/3 9:42		
<b>O-Rings</b>	<b>A</b>			3596.6	12/31 11:59	3596.6	1/3 9:42		
	<b>B</b>			3643.0	12/31 12:00	3643.0	1/3 9:42		
	<b>C - 1st Hour</b>			4409.8	12/31 12:00	4409.8	1/3 9:42		

<b>Train A Aggregate, mg:</b>	<b>2.6</b>
<b>Train B Aggregate, mg:</b>	<b>2.7</b>
<b>Train C Aggregate, mg:</b>	<b>2.4</b>
<b>Ambient Aggregate, mg:</b>	<b>0.1</b>

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 4 Data Summary**

Client: SBI  
Model: J.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/20/2022

Data from 12/20/2022 testing - reference only

A handwritten signature in black ink, appearing to read "A. J. [unclear]".

\_\_\_\_\_  
Technician Signature

7/12/2023

\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

<b>Burn Rate (kg/hr):</b>	<b>0.88</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	100.442	78.773	79.127	10.284
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.83			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	21033.6			
Average Gas Meter Temperature (°F)	79.6	72.5	71.8	73.0
Total Sample Volume (dscf)	98.803	79.537	79.682	10.131
Average Tunnel Temperature (°F)	88.6			
Total Time of Test (min)	450			
Total Particulate Catch (mg)	0.1	3.7	3.6	2.1
Particulate Concentration, dry-standard (g/dscf)	0.000010	0.0000465	0.0000452	0.0002073
Total PM Emissions (g)	0.16	7.18	6.97	4.34
Particulate Emission Rate (g/hr)	0.02	0.96	0.93	4.34
Emissions Factor (g/kg)	-	1.09	1.06	-
Difference from Average Total Particulate Emissions (g)	-	0.11	0.11	-
Difference from Average Total Particulate Emissions (%)	-	1.5%	1.5%	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	7.07
Particulate Emission Rate (g/hr)	0.94
Emissions Factor (g/kg)	1.07
HHV Efficiency (%)	73.8%
LHV Efficiency (%)	79.0%
CO Emissions (g/min)	0.88

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 81.7/Max: 89.5	OK
Face Velocity	< 30 ft/min	9.6	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:75/Max:89.5	OK
Negative Probe Weight Evaluation	<5% of Total Catch	-4.8%	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/20/22  
**Run:** 4  
**Control #:** 22-835  
**Test Duration:** 450  
**Output Category:** Low

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	73.8%	79.0%
<b>Combustion Efficiency</b>	95.8%	95.8%
<b>Heat Transfer Efficiency</b>	77.0%	82.5%

<b>Output Rate (kJ/h)</b>	12,161	11,536	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	0.88	1.93	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	16,481	15,634	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.57	14.49	<b>dry lb</b>
<b>MC wet (%)</b>	16.62		
<b>MC dry (%)</b>	19.94		
<b>Particulate (g)</b>	7.07		
<b>CO (g)</b>	396		
<b>Test Duration (h)</b>	7.50		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.08	4.34
<b>g/kg Dry Fuel</b>	1.08	60.18
<b>g/h</b>	0.94	52.76
<b>g/min</b>	0.02	0.88
<b>lb/MM Btu Output</b>	0.18	10.08

<b>Air/Fuel Ratio (A/F)</b>	17.48
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VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/20/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.89  
 Max Allowable Start-up Fuel Weight (lbs): 4.33

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	3.06	In Range	26.8	17.9	18.9	21.2	In Range	2.53	1.15
2	15.83	2.87	In Range	22.0	18.4	18.1	19.5	In Range	2.40	1.09
3	15.75	2.45	In Range	26.6	16.8	18.3	20.6	In Range	2.03	0.92
Core Load Wt. (lbs)		8.38	In Range							

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	2.38	In Range	27.0	14.3	14.2	18.5	In Range	2.01	0.91
2	16.00	3.67	In Range	28.1	16.2	14.9	19.7	In Range	3.06	1.39
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.05	In Range							

Total Load Weight (lbs): 14.43 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: 100% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.0  
 Total Load Average Moisture Content (%DB): 19.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.6  
 Total Test Load Weight (dry basis): 12.03 lbs 5.46 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.84	In Range	10	10	10	10.0	In Range	2.58	1.17

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.19	In Range	24.6	18.8	19.9	21.1	In Range	3.46	1.57

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.4 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 1.97 In Range

## LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/20/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 12  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 17.28  
 Total Load Weight Range (lbs): 16.42 to 18.14  
 Core Load Weight Range (lbs): 7.78 to 11.23  
 Remainder Load Weight Range (lbs): 6.05 to 9.50  
 Core Load Piece Range (lbs): 2.59 to 4.32  
 Remainder Load Piece Range (lbs): 1.73 to 5.18

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	15.75	3.56	In Range	26.3	16.7	17.6	20.2	In Range	2.96	1.34	
2	16.00	3.56	In Range	27.7	22.0	15.8	21.8	In Range	2.92	1.32	
3	16.25	3.49	In Range	25.6	17.2	18.7	20.5	In Range	2.90	1.31	
Core Load Wt. (lbs)		10.61	In Range								

### REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	16.00	4.14	In Range	27.0	14.3	15.4	18.9	In Range	3.48	1.58	
2	16.00	2.70	In Range	27.2	15.3	11.1	18.0	In Range	2.29	1.04	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.84	In Range								

Remainder Load Small/Large Piece Weight Ratio: 65% In Range ≤ 67%  
 Total Load Weight (lbs): 17.45 In Range  
 Core Load % of Total Weight: 61% In Range 45-65%  
 Remainder % of Total Weight: 39% In Range 35-55%  
 Total Load % of Target Weight: 101% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 12.1  
 Total Load Average Moisture Content (%DB): 19.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.6  
 Total Test Load Weight (dry basis): 14.55 lbs 6.60 kg

### TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 1.8 to 3.4  
 Actual Charcoal Bed Wt. (lb): 2.81 In Range

### TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.00 Valid Test (≥90%)

Total Fuel Burned During Test Run:  
 17.4 lbs, wet basis  
 14.5 lbs, dry basis  
 6.60 kg, dry basis

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4  
 Test Start Time: 12:27  
 Test Type: Low Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 450

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.78	29.81	29.80
Relative Humidity (%)	26.4	34.5	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	100.442 ft <sup>3</sup>		

### Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.066	80
2	0.078	80
3	0.076	80
4	0.067	80
5	0.054	80
6	0.072	80
7	0.075	80
8	0.069	80
Center	0.079	80

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 17.71 ft/sec  
 V<sub>scnt</sub>: 18.89 ft/sec  
 F<sub>p</sub>: 0.937 [ratio]

Initial Tunnel Flow: 353.6 scf/min

Static Pressure: -0.165 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594



# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 4

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/20/2022

**Low Fire Performed as a continuation of High Fire Test, see Run 3 test data for details**

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.072	0.00	72.3	0.23		17.38		129.6	422.2	86.6	85.4
1			0.074	0.00	72.3	0.23	-	17.33	-0.05	134.3	400.1	86.8	87.8
2			0.069	0.00	72.4	0.25	-	17.10	-0.24	150.3	443.9	87.4	86.1
3			0.072	0.00	72.5	0.23	-	16.81	-0.29	150.1	535.2	87.2	85.0
4			0.074	0.00	72.5	0.23	-	16.64	-0.17	128.7	549.7	84.6	83.9
5			0.075	0.00	72.6	0.23	-	16.43	-0.22	120.3	560.1	84.3	85.5
6			0.075	0.00	72.7	0.21	-	16.21	-0.22	117.4	560.4	84.5	87.8
7			0.074	0.00	72.7	0.23	-	16.05	-0.16	118.0	556.7	84.6	86.2
8			0.075	0.00	72.8	0.22	-	15.87	-0.18	114.8	553.6	84.5	87.8
9			0.075	0.00	72.8	0.22	-	15.68	-0.19	113.6	553.9	84.3	88.7
10	1.726	0.173	0.076	0.00	72.8	0.22	100	15.49	-0.19	112.5	548.0	84.2	88.4
11			0.075	0.00	72.9	0.21	-	15.33	-0.15	112.4	542.6	84.1	87.6
12			0.074	0.00	72.9	0.22	-	15.15	-0.18	112.4	542.8	84.1	87.7
13			0.075	0.00	73.0	0.20	-	14.97	-0.18	119.0	553.6	84.3	88.7
14			0.075	0.00	73.0	0.23	-	14.79	-0.18	116.2	547.5	84.1	88.1
15			0.075	0.00	73.0	0.23	-	14.66	-0.13	112.7	517.5	83.8	88.4
16			0.077	0.00	73.0	0.22	-	14.54	-0.12	110.9	500.0	83.5	87.8
17			0.076	0.00	73.0	0.22	-	14.47	-0.07	106.6	480.7	82.9	87.7
18			0.076	0.00	73.0	0.22	-	14.36	-0.11	104.3	465.7	82.6	89.5
19			0.076	0.00	73.1	0.22	-	14.25	-0.12	105.2	460.6	82.1	88.5
20	3.419	0.169	0.076	0.00	73.1	0.21	100	14.13	-0.12	108.3	459.8	82.0	85.9
21			0.076	0.00	73.1	0.21	-	14.03	-0.10	108.5	459.1	81.7	84.7
22			0.077	0.00	73.1	0.22	-	13.93	-0.10	108.5	457.8	82.2	84.4
23			0.078	0.00	73.1	0.20	-	13.83	-0.10	108.1	457.1	82.9	84.3
24			0.077	0.00	73.1	0.21	-	13.74	-0.08	108.6	456.9	83.4	84.0
25			0.078	0.00	73.2	0.22	-	13.67	-0.07	108.3	456.8	83.9	84.1
26			0.077	0.00	73.2	0.22	-	13.58	-0.09	107.2	455.5	84.2	82.5
27			0.077	0.00	73.2	0.21	-	13.49	-0.09	106.1	454.5	84.5	82.7
28			0.077	0.00	73.2	0.20	-	13.42	-0.07	105.7	453.7	85.1	82.2
29			0.077	0.00	73.2	0.20	-	13.31	-0.11	105.3	454.1	85.4	82.7
30	5.118	0.170	0.077	0.00	73.2	0.21	100	13.19	-0.12	104.9	453.1	85.7	81.0
31			0.076	0.00	73.1	0.23	-	13.09	-0.10	104.5	453.9	85.9	82.2
32			0.077	0.00	73.1	0.21	-	12.97	-0.12	104.5	454.6	86.1	82.0

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.077	0.00	73.0	0.21	-	12.84	-0.13	104.5	455.7	86.2	82.2
34			0.077	0.00	73.0	0.21	-	12.73	-0.11	103.5	456.9	86.0	81.0
35			0.077	0.00	73.0	0.21	-	12.60	-0.13	102.8	457.7	85.8	81.4
36			0.077	0.00	73.0	0.20	-	12.48	-0.13	102.3	459.0	85.5	81.8
37			0.076	0.00	73.0	0.20	-	12.33	-0.14	102.0	461.3	85.3	81.3
38			0.078	0.00	73.1	0.20	-	12.19	-0.14	102.0	464.0	85.2	81.3
39			0.077	0.00	73.1	0.21	-	12.05	-0.14	101.9	466.9	85.1	80.4
40	6.821	0.170	0.078	0.00	73.1	0.21	99	11.91	-0.14	101.8	470.1	85.0	81.0
41			0.076	0.00	73.1	0.22	-	11.78	-0.13	101.9	471.4	85.0	80.3
42			0.076	0.00	73.1	0.22	-	11.63	-0.15	101.8	472.2	85.0	81.1
43			0.079	0.00	73.1	0.23	-	11.49	-0.14	101.6	472.1	84.9	81.1
44			0.078	0.00	73.1	0.23	-	11.35	-0.14	101.5	473.6	84.9	80.5
45			0.077	0.00	73.0	0.22	-	11.21	-0.14	101.5	474.1	84.9	81.0
46			0.078	0.00	73.1	0.24	-	11.07	-0.14	101.4	473.2	84.8	80.9
47			0.076	0.00	73.1	0.23	-	10.94	-0.13	101.3	472.9	84.7	80.3
48			0.076	0.00	73.1	0.23	-	10.80	-0.13	101.2	473.1	84.6	81.2
49			0.076	0.00	73.0	0.23	-	10.65	-0.16	101.2	474.4	84.6	80.2
50	8.551	0.173	0.076	0.00	73.1	0.23	101	10.52	-0.13	101.2	474.6	84.4	81.0
51			0.077	0.00	73.0	0.24	-	10.38	-0.14	101.0	474.4	84.4	80.3
52			0.076	0.00	72.9	0.24	-	10.25	-0.13	101.1	475.8	84.3	80.7
53			0.077	0.00	72.9	0.23	-	10.09	-0.15	100.9	477.2	84.2	80.2
54			0.078	0.00	72.9	0.25	-	9.94	-0.15	100.8	475.8	84.3	80.1
55			0.078	0.00	72.9	0.25	-	9.80	-0.14	100.7	475.2	84.5	80.0
56			0.079	0.00	73.0	0.25	-	9.66	-0.13	100.6	475.2	84.7	80.8
57			0.077	0.00	73.1	0.26	-	9.55	-0.11	100.5	474.5	85.0	79.6
58			0.077	0.00	73.1	0.28	-	9.41	-0.15	100.5	474.0	84.9	80.2
59			0.077	0.00	73.1	0.28	-	9.27	-0.14	100.5	473.0	84.9	80.7
60	10.284	0.173	0.077	0.00	73.1	0.28	102	9.14	-0.13	100.5	472.9	85.2	80.2
61			0.077	0.00	73.1	0.29	-	9.02	-0.12	100.3	472.1	85.2	80.8
62			0.077	0.00	73.1	0.30	-	8.88	-0.13	100.5	470.3	85.2	80.1
63			0.078	0.00	73.2	0.32	-	8.75	-0.13	100.3	470.0	85.2	79.2
64			0.079	0.00	73.3	0.34	-	8.63	-0.13	100.3	468.0	85.4	80.4
65			0.079	0.00	73.4	0.35	-	8.52	-0.11	100.0	466.0	85.5	79.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.079	0.00	73.4	0.33	-	8.38	-0.14	99.9	462.5	85.5	80.5
67			0.078	0.00	73.5	0.35	-	8.27	-0.12	100.1	461.0	85.5	79.9
68			0.078	0.00	73.5	0.36	-	8.14	-0.12	99.6	460.0	85.6	79.5
69			0.079	0.00	73.5	0.37	-	8.02	-0.12	99.5	458.6	85.6	79.8
70	12.005	0.172	0.078	0.00	73.5	0.37	100	7.91	-0.11	99.6	458.8	85.6	80.1
71			0.078	0.00	73.5	0.37	-	7.78	-0.12	99.4	457.3	85.5	80.5
72			0.078	0.00	73.6	0.40	-	7.65	-0.13	99.3	456.1	85.7	80.5
73			0.077	0.00	73.5	0.40	-	7.54	-0.11	99.2	454.6	85.4	80.0
74			0.076	0.00	73.6	0.41	-	7.42	-0.12	99.2	452.4	85.3	80.4
75			0.080	0.00	73.6	0.42	-	7.30	-0.13	98.7	451.3	85.2	79.9
76			0.078	0.00	73.7	0.42	-	7.18	-0.12	98.6	447.5	85.0	80.0
77			0.080	0.00	73.8	0.42	-	7.06	-0.11	98.5	444.8	84.8	80.7
78			0.077	0.00	73.8	0.45	-	6.95	-0.11	98.1	442.2	84.9	79.9
79			0.077	0.00	73.8	0.43	-	6.83	-0.12	98.2	439.5	84.8	79.9
80	13.736	0.173	0.077	0.00	73.7	0.44	100	6.73	-0.10	97.9	436.9	84.5	79.2
81			0.078	0.00	73.7	0.45	-	6.63	-0.11	97.8	435.1	84.3	80.2
82			0.077	0.00	73.6	0.45	-	6.51	-0.11	97.5	432.7	84.1	79.2
83			0.078	0.00	73.5	0.45	-	6.40	-0.11	97.5	431.3	83.9	80.0
84			0.078	0.00	73.5	0.44	-	6.29	-0.11	97.3	431.3	83.8	79.1
85			0.077	0.00	73.4	0.45	-	6.19	-0.10	97.3	431.0	83.9	79.6
86			0.077	0.00	73.3	0.47	-	6.12	-0.07	97.2	430.6	84.0	80.0
87			0.077	0.00	73.2	0.47	-	6.02	-0.10	97.1	431.6	84.2	79.7
88			0.077	0.00	73.2	0.45	-	5.92	-0.10	97.0	432.6	84.2	79.8
89			0.078	0.00	73.2	0.46	-	5.83	-0.09	97.0	433.3	84.3	80.2
90	15.476	0.174	0.079	0.00	73.2	0.46	101	5.73	-0.10	97.1	432.7	84.3	79.7
91			0.078	0.00	73.2	0.47	-	5.62	-0.11	97.1	432.4	84.5	79.1
92			0.078	0.00	73.2	0.47	-	5.50	-0.11	97.0	433.0	84.5	79.4
93			0.079	0.00	73.1	0.46	-	5.39	-0.11	97.5	433.2	84.5	79.3
94			0.078	0.00	73.1	0.47	-	5.29	-0.11	98.6	433.1	84.8	80.5
95			0.077	0.00	73.2	0.47	-	5.18	-0.10	99.3	433.7	84.9	81.1
96			0.078	0.00	73.1	0.48	-	5.08	-0.11	100.0	433.8	84.9	81.4
97			0.077	0.00	73.1	0.49	-	4.98	-0.10	100.2	433.6	85.0	81.6
98			0.077	0.00	73.1	0.49	-	4.89	-0.09	100.5	432.6	85.2	81.6

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.077	0.00	73.0	0.49	-	4.80	-0.09	100.6	431.3	85.2	82.1
100	17.204	0.173	0.076	0.00	73.0	0.49	100	4.72	-0.08	100.9	430.1	85.3	82.1
101			0.076	0.00	73.0	0.50	-	4.63	-0.10	100.9	427.2	85.5	82.0
102			0.078	0.00	73.0	0.49	-	4.58	-0.05	100.5	422.5	85.4	81.1
103			0.076	0.00	73.0	0.49	-	4.51	-0.07	100.2	416.1	85.6	81.5
104			0.077	0.00	72.9	0.51	-	4.45	-0.06	99.9	409.3	85.7	81.7
105			0.076	0.00	72.9	0.50	-	4.38	-0.07	99.8	404.3	85.8	82.4
106			0.077	0.00	72.9	0.50	-	4.32	-0.06	99.5	399.3	85.9	82.6
107			0.078	0.00	73.0	0.50	-	4.28	-0.04	99.4	394.6	86.0	82.9
108			0.077	0.00	73.0	0.49	-	4.21	-0.07	99.2	391.5	86.2	82.4
109			0.078	0.00	73.0	0.49	-	4.18	-0.03	99.1	388.9	86.1	82.5
110	18.949	0.175	0.077	0.00	72.9	0.50	102	4.13	-0.05	98.9	384.8	86.2	82.4
111			0.077	0.00	72.9	0.50	-	4.10	-0.03	98.7	377.8	86.1	82.5
112			0.077	0.00	72.8	0.49	-	4.08	-0.02	98.3	367.4	86.2	82.3
113			0.078	0.00	72.8	0.50	-	4.04	-0.04	97.9	355.1	86.1	82.3
114			0.076	0.00	72.8	0.49	-	4.02	-0.02	97.5	346.2	86.1	82.2
115			0.078	0.00	72.8	0.49	-	3.98	-0.04	97.2	338.0	86.1	82.5
116			0.079	0.00	72.8	0.50	-	3.95	-0.03	96.7	331.9	86.1	82.1
117			0.077	0.00	72.7	0.51	-	3.94	-0.01	96.4	326.1	86.2	82.1
118			0.079	0.00	72.8	0.51	-	3.91	-0.03	95.8	320.8	86.1	82.3
119			0.078	0.00	72.7	0.50	-	3.86	-0.05	95.1	316.0	86.1	82.7
120	20.693	0.174	0.079	0.00	72.8	0.51	101	3.84	-0.02	94.9	311.2	86.0	83.2
121			0.078	0.00	72.7	0.52	-	3.81	-0.03	94.6	307.5	86.0	83.4
122			0.078	0.00	72.7	0.52	-	3.77	-0.05	94.5	305.7	85.8	83.4
123			0.078	0.00	72.8	0.55	-	3.74	-0.03	94.3	302.4	85.8	83.3
124			0.078	0.00	72.7	0.55	-	3.70	-0.04	93.2	299.5	85.7	84.6
125			0.079	0.00	72.8	0.56	-	3.66	-0.04	92.6	298.2	85.6	85.4
126			0.079	0.00	72.7	0.58	-	3.62	-0.04	92.5	296.7	85.6	85.6
127			0.078	0.00	72.8	0.58	-	3.59	-0.03	92.3	294.7	85.5	85.8
128			0.077	0.00	72.8	0.60	-	3.56	-0.03	92.1	292.8	85.3	86.1
129			0.079	0.00	72.7	0.62	-	3.54	-0.03	92.1	291.0	85.2	86.3
130	22.424	0.173	0.078	0.00	72.8	0.62	99	3.51	-0.03	92.0	287.5	85.2	86.0
131			0.079	0.00	72.7	0.65	-	3.48	-0.03	91.9	284.5	85.0	86.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132			0.079	0.00	72.8	0.65	-	3.47	-0.01	91.6	282.1	85.0	86.2
133			0.079	0.00	72.7	0.65	-	3.44	-0.02	91.4	279.8	84.9	86.6
134			0.079	0.00	72.7	0.65	-	3.43	-0.02	91.2	277.6	84.8	87.0
135			0.079	0.00	72.6	0.61	-	3.42	-0.01	91.0	275.4	84.7	86.5
136			0.079	0.00	72.7	0.62	-	3.41	-0.01	91.0	273.6	84.7	86.4
137			0.079	0.00	72.7	0.61	-	3.39	-0.02	90.8	271.4	84.6	86.2
138			0.079	0.00	72.6	0.61	-	3.37	-0.01	90.6	269.5	84.5	86.6
139			0.079	0.00	72.7	0.60	-	3.36	-0.02	90.5	267.6	84.4	86.9
140	24.168	0.174	0.079	0.00	72.7	0.60	100	3.34	-0.02	90.4	266.0	84.3	87.1
141			0.078	0.00	72.7	0.60	-	3.33	-0.01	91.6	265.4	84.3	85.3
142			0.078	0.00	72.7	0.59	-	3.34	0.01	92.4	264.9	84.5	83.1
143			0.079	0.00	72.7	0.59	-	3.36	0.02	92.3	263.7	84.6	82.9
144			0.079	0.00	72.7	0.60	-	3.37	0.01	91.9	262.4	84.5	82.2
145			0.080	0.00	72.7	0.58	-	3.38	0.01	91.8	260.7	84.6	82.5
146			0.078	0.00	72.7	0.59	-	3.38	0.01	91.4	259.0	84.6	82.0
147			0.079	0.00	72.7	0.59	-	3.40	0.01	91.2	257.5	84.5	81.8
148			0.080	0.00	72.7	0.58	-	3.37	-0.03	90.4	255.7	84.5	81.3
149			0.079	0.00	72.6	0.58	-	3.35	-0.02	90.0	254.1	84.5	81.6
150	25.925	0.176	0.078	0.00	72.6	0.58	101	3.31	-0.04	90.0	252.8	84.3	81.4
151			0.079	0.00	72.7	0.58	-	3.27	-0.03	90.0	251.3	84.3	82.0
152			0.081	0.00	72.7	0.59	-	3.26	-0.01	90.0	250.4	84.2	82.0
153			0.081	0.00	72.7	0.59	-	3.24	-0.02	89.9	249.3	84.2	81.9
154			0.080	0.00	72.6	0.58	-	3.22	-0.02	89.8	248.3	84.2	81.9
155			0.080	0.00	72.6	0.58	-	3.22	0.00	90.0	247.5	84.2	81.0
156			0.080	0.00	72.7	0.57	-	3.23	0.01	89.9	246.3	84.2	80.6
157			0.081	0.00	72.7	0.58	-	3.23	0.00	89.8	245.5	84.2	81.3
158			0.079	0.00	72.7	0.57	-	3.24	0.01	89.7	244.6	84.3	81.3
159			0.080	0.00	72.6	0.57	-	3.23	-0.01	89.3	243.3	84.2	79.8
160	27.680	0.176	0.080	0.00	72.7	0.56	100	3.22	-0.01	88.5	242.6	84.1	80.4
161			0.079	0.00	72.7	0.56	-	3.23	0.01	87.9	241.4	84.0	80.1
162			0.079	0.00	72.7	0.55	-	3.21	-0.02	87.7	239.7	84.0	79.5
163			0.081	0.00	72.8	0.56	-	3.21	0.00	87.3	238.5	83.9	79.8
164			0.080	0.00	72.8	0.54	-	3.20	-0.01	87.0	237.2	83.9	79.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165			0.080	0.00	72.8	0.56	-	3.17	-0.03	86.8	235.9	83.8	80.2
166			0.082	0.00	72.7	0.55	-	3.17	-0.01	86.6	234.7	83.9	79.5
167			0.080	0.00	72.8	0.56	-	3.15	-0.02	86.5	233.7	83.9	79.2
168			0.080	0.00	72.8	0.55	-	3.14	-0.01	86.4	232.6	83.9	79.7
169			0.080	0.00	72.8	0.56	-	3.14	0.00	86.3	231.7	83.8	79.9
170	29.434	0.175	0.081	0.00	72.8	0.55	99	3.12	-0.02	86.1	230.5	83.5	79.4
171			0.081	0.00	72.8	0.55	-	3.09	-0.02	85.9	229.8	83.5	79.3
172			0.079	0.00	72.7	0.55	-	3.09	-0.01	85.8	228.7	83.4	79.1
173			0.081	0.00	72.6	0.55	-	3.08	-0.01	85.6	227.8	83.3	78.7
174			0.080	0.00	72.7	0.56	-	3.05	-0.02	85.5	226.9	83.2	79.0
175			0.081	0.00	72.7	0.56	-	3.05	0.00	85.4	226.4	83.1	79.4
176			0.080	0.00	72.7	0.54	-	3.01	-0.04	85.2	225.4	83.1	78.9
177			0.080	0.00	72.6	0.55	-	2.97	-0.04	85.5	224.3	83.0	79.5
178			0.080	0.00	72.5	0.55	-	2.93	-0.04	85.7	223.6	82.9	79.8
179			0.081	0.00	72.6	0.56	-	2.90	-0.03	85.9	223.0	82.9	79.9
180	31.189	0.176	0.080	0.00	72.7	0.55	99	2.88	-0.02	85.9	222.5	82.9	79.9
181			0.080	0.00	72.7	0.56	-	2.85	-0.03	86.0	222.2	82.8	79.9
182			0.080	0.00	72.7	0.55	-	2.83	-0.02	86.0	221.6	82.6	79.8
183			0.080	0.00	72.7	0.55	-	2.80	-0.03	85.9	221.1	82.5	79.8
184			0.079	0.00	72.7	0.55	-	2.78	-0.02	85.9	220.3	82.5	79.6
185			0.081	0.00	72.7	0.55	-	2.76	-0.02	86.0	220.1	82.4	80.1
186			0.079	0.00	72.7	0.55	-	2.74	-0.02	85.9	219.5	82.4	79.8
187			0.079	0.00	72.7	0.55	-	2.73	-0.02	85.8	219.2	82.4	79.8
188			0.080	0.00	72.7	0.55	-	2.71	-0.02	85.8	218.9	82.3	79.8
189			0.080	0.00	72.8	0.56	-	2.69	-0.02	85.7	218.5	82.2	79.8
190	32.951	0.176	0.080	0.00	72.7	0.56	100	2.68	-0.01	85.8	217.9	82.2	79.7
191			0.080	0.00	72.7	0.56	-	2.66	-0.02	85.7	217.3	82.2	79.8
192			0.080	0.00	72.7	0.55	-	2.65	-0.01	85.7	217.3	82.1	79.7
193			0.080	0.00	72.6	0.57	-	2.63	-0.02	85.6	216.9	82.1	79.7
194			0.081	0.00	72.7	0.56	-	2.61	-0.02	85.6	216.6	82.1	79.6
195			0.081	0.00	72.6	0.57	-	2.59	-0.01	85.5	216.2	82.2	79.6
196			0.080	0.00	72.6	0.57	-	2.58	-0.01	85.4	216.0	82.2	80.0
197			0.080	0.00	72.6	0.57	-	2.57	-0.01	85.4	215.5	82.2	79.6

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198			0.081	0.00	72.5	0.56	-	2.55	-0.02	85.2	215.0	82.1	79.7
199			0.079	0.00	72.5	0.56	-	2.53	-0.02	85.3	214.9	82.1	79.7
200	34.715	0.176	0.080	0.00	72.6	0.57	100	2.51	-0.02	85.3	214.3	82.2	79.8
201			0.080	0.00	72.6	0.56	-	2.50	-0.01	85.3	213.9	82.3	79.8
202			0.080	0.00	72.6	0.57	-	2.49	-0.01	85.2	213.6	82.4	79.7
203			0.079	0.00	72.6	0.57	-	2.47	-0.02	85.2	212.9	82.3	79.8
204			0.080	0.00	72.5	0.57	-	2.47	0.00	85.1	212.5	82.2	79.7
205			0.079	0.00	72.5	0.56	-	2.44	-0.03	85.0	212.2	82.2	79.7
206			0.080	0.00	72.5	0.57	-	2.44	0.00	84.9	211.7	82.1	79.7
207			0.080	0.00	72.5	0.56	-	2.42	-0.01	84.8	211.4	82.1	79.9
208			0.081	0.00	72.5	0.56	-	2.40	-0.02	84.8	210.9	82.1	79.6
209			0.080	0.00	72.5	0.57	-	2.39	-0.01	84.7	210.6	82.1	79.9
210	36.484	0.177	0.079	0.00	72.5	0.57	100	2.39	-0.01	84.8	210.2	82.1	79.6
211			0.079	0.00	72.5	0.57	-	2.37	-0.02	84.7	209.9	82.5	79.8
212			0.080	0.00	72.5	0.57	-	2.34	-0.02	84.7	209.4	83.1	79.5
213			0.079	0.00	72.6	0.58	-	2.33	-0.01	84.6	209.1	83.8	79.6
214			0.079	0.00	72.6	0.57	-	2.32	-0.01	84.6	208.7	84.2	79.6
215			0.079	0.00	72.6	0.58	-	2.31	-0.02	84.5	208.3	84.7	79.6
216			0.079	0.00	72.6	0.58	-	2.30	-0.01	84.5	208.0	85.0	79.6
217			0.079	0.00	72.6	0.58	-	2.29	-0.01	84.5	207.6	85.4	79.5
218			0.079	0.00	72.6	0.58	-	2.27	-0.01	84.4	207.2	85.7	79.4
219			0.080	0.00	72.6	0.58	-	2.26	-0.01	84.3	207.1	85.9	79.6
220	38.248	0.176	0.079	0.00	72.6	0.59	100	2.24	-0.01	84.4	206.8	86.1	79.3
221			0.079	0.00	72.5	0.59	-	2.23	-0.02	84.3	206.5	86.5	79.2
222			0.079	0.00	72.5	0.58	-	2.21	-0.01	84.2	206.4	86.4	79.1
223			0.079	0.00	72.5	0.59	-	2.20	-0.01	84.1	206.1	86.0	79.3
224			0.080	0.00	72.5	0.59	-	2.19	-0.01	84.2	206.0	85.7	79.5
225			0.080	0.00	72.6	0.58	-	2.17	-0.01	84.1	205.3	85.5	79.4
226			0.079	0.00	72.5	0.58	-	2.16	-0.01	84.0	205.2	85.3	79.1
227			0.080	0.00	72.6	0.59	-	2.15	-0.02	84.0	204.8	85.0	79.1
228			0.079	0.00	72.5	0.57	-	2.13	-0.02	84.0	204.4	85.0	79.3
229			0.079	0.00	72.5	0.59	-	2.13	0.00	83.9	204.0	85.0	79.4
230	40.004	0.176	0.080	0.00	72.5	0.58	100	2.11	-0.02	83.9	204.0	85.1	79.3



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231			0.079	0.00	72.5	0.59	-	2.10	-0.01	83.8	203.8	85.1	79.1
232			0.079	0.00	72.4	0.59	-	2.08	-0.01	83.8	203.5	84.9	79.1
233			0.080	0.00	72.5	0.58	-	2.08	-0.01	83.7	203.2	84.6	79.2
234			0.079	0.00	72.4	0.59	-	2.06	-0.02	83.6	203.0	84.6	79.1
235			0.080	0.00	72.3	0.59	-	2.04	-0.02	83.7	202.7	84.5	79.0
236			0.079	0.00	72.3	0.58	-	2.04	-0.01	83.6	202.6	84.4	79.2
237			0.079	0.00	72.4	0.56	-	2.03	-0.01	83.6	202.2	84.4	79.2
238			0.080	0.00	72.4	0.58	-	2.01	-0.02	83.6	202.1	84.4	79.1
239			0.080	0.00	72.5	0.59	-	2.00	-0.01	83.4	201.5	84.4	79.3
240	41.757	0.175	0.079	0.00	72.5	0.59	99	1.98	-0.02	83.4	201.5	84.5	79.2
241			0.080	0.00	72.3	0.58	-	1.97	-0.01	83.4	201.1	84.7	79.2
242			0.079	0.00	72.4	0.59	-	1.96	-0.01	83.3	201.1	84.8	79.1
243			0.080	0.00	72.3	0.59	-	1.94	-0.02	83.3	201.0	84.6	79.1
244			0.079	0.00	72.4	0.59	-	1.93	-0.02	83.2	200.4	84.5	79.3
245			0.079	0.00	72.3	0.59	-	1.92	-0.01	83.3	200.3	84.4	79.0
246			0.080	0.00	72.3	0.59	-	1.91	-0.01	83.3	200.1	84.3	79.0
247			0.080	0.00	72.3	0.59	-	1.89	-0.02	83.3	200.1	84.2	78.6
248			0.079	0.00	72.3	0.59	-	1.89	0.00	83.2	199.5	84.1	79.1
249			0.080	0.00	72.4	0.59	-	1.88	-0.01	83.1	199.5	84.1	78.9
250	43.516	0.176	0.080	0.00	72.3	0.60	99	1.85	-0.02	83.1	199.4	83.9	78.8
251			0.081	0.00	72.3	0.61	-	1.85	0.00	83.1	199.1	83.9	78.9
252			0.080	0.00	72.3	0.59	-	1.83	-0.02	83.1	198.9	83.8	79.0
253			0.079	0.00	72.2	0.60	-	1.83	0.00	83.0	198.9	83.7	78.8
254			0.081	0.00	72.3	0.60	-	1.81	-0.02	83.0	198.6	83.6	78.9
255			0.080	0.00	72.2	0.59	-	1.80	-0.01	82.9	198.2	83.4	78.9
256			0.080	0.00	72.2	0.61	-	1.80	0.00	83.0	198.0	83.3	78.8
257			0.081	0.00	72.2	0.61	-	1.77	-0.03	82.9	197.9	83.5	78.6
258			0.080	0.00	72.2	0.61	-	1.76	-0.01	82.8	197.8	83.7	78.5
259			0.080	0.00	72.3	0.60	-	1.74	-0.02	82.8	197.6	83.9	78.7
260	45.286	0.177	0.080	0.00	72.3	0.61	100	1.74	0.00	82.7	197.4	84.0	78.7
261			0.079	0.00	72.4	0.60	-	1.73	-0.01	82.7	197.2	84.0	78.9
262			0.080	0.00	72.3	0.61	-	1.71	-0.02	82.7	197.2	84.1	78.7
263			0.079	0.00	72.3	0.60	-	1.69	-0.02	82.7	196.9	84.1	78.5

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264			0.079	0.00	72.4	0.61	-	1.68	-0.01	82.7	196.8	84.2	78.7
265			0.081	0.00	72.3	0.61	-	1.68	0.00	82.6	196.7	83.9	78.8
266			0.080	0.00	72.2	0.61	-	1.66	-0.02	82.5	196.4	83.9	78.9
267			0.081	0.00	72.2	0.60	-	1.65	-0.01	82.5	196.3	83.9	78.6
268			0.080	0.00	72.2	0.60	-	1.63	-0.01	82.6	196.4	83.8	78.8
269			0.079	0.00	72.3	0.58	-	1.62	-0.01	82.5	196.4	83.7	78.6
270	47.058	0.177	0.079	0.00	72.3	0.59	100	1.62	-0.01	82.5	195.9	83.7	78.4
271			0.079	0.00	72.2	0.59	-	1.61	-0.01	82.5	196.0	83.6	78.4
272			0.079	0.00	72.3	0.60	-	1.58	-0.02	82.4	195.9	83.4	78.5
273			0.080	0.00	72.2	0.59	-	1.58	-0.01	82.4	195.8	83.3	78.8
274			0.080	0.00	72.2	0.60	-	1.57	-0.01	82.4	195.8	83.2	78.3
275			0.080	0.00	72.2	0.60	-	1.56	-0.01	82.4	195.7	83.3	78.5
276			0.079	0.00	72.2	0.61	-	1.54	-0.02	82.4	195.6	83.1	78.9
277			0.080	0.00	72.2	0.60	-	1.53	-0.01	82.3	195.4	83.1	78.5
278			0.080	0.00	72.1	0.61	-	1.51	-0.02	82.4	195.2	83.0	78.6
279			0.080	0.00	72.2	0.61	-	1.51	-0.01	82.3	195.1	83.0	78.6
280	48.823	0.176	0.079	0.00	72.2	0.61	100	1.49	-0.02	82.3	194.8	83.0	78.3
281			0.080	0.00	72.2	0.62	-	1.49	-0.01	82.2	194.7	82.9	78.4
282			0.080	0.00	72.2	0.61	-	1.47	-0.01	82.2	194.9	82.8	78.4
283			0.081	0.00	72.3	0.61	-	1.46	-0.01	82.1	194.7	82.9	78.3
284			0.080	0.00	72.3	0.61	-	1.46	0.00	82.2	194.6	82.8	78.1
285			0.079	0.00	72.3	0.62	-	1.44	-0.02	82.3	194.4	82.8	78.6
286			0.079	0.00	72.3	0.63	-	1.45	0.01	82.4	194.4	82.9	78.4
287			0.080	0.00	72.3	0.62	-	1.45	0.00	82.4	194.3	83.0	78.8
288			0.080	0.00	72.3	0.62	-	1.44	-0.01	82.3	194.5	83.0	78.4
289			0.079	0.00	72.3	0.62	-	1.44	0.01	82.3	194.3	83.0	78.2
290	50.586	0.176	0.080	0.00	72.3	0.62	100	1.43	-0.01	82.3	194.1	83.1	78.3
291			0.081	0.00	72.4	0.62	-	1.42	-0.02	82.2	194.1	83.0	78.3
292			0.080	0.00	72.4	0.62	-	1.42	0.00	82.2	193.7	83.1	78.0
293			0.080	0.00	72.3	0.62	-	1.41	0.00	82.1	193.7	83.1	78.0
294			0.080	0.00	72.2	0.61	-	1.40	-0.02	82.1	193.4	83.1	78.1
295			0.080	0.00	72.2	0.61	-	1.38	-0.01	82.1	193.5	83.1	78.1
296			0.080	0.00	72.2	0.61	-	1.37	-0.02	82.1	193.3	83.2	78.1

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297			0.081	0.00	72.1	0.62	-	1.36	0.00	82.1	193.4	83.1	78.0
298			0.079	0.00	72.1	0.61	-	1.35	-0.01	82.0	193.0	83.3	77.8
299			0.080	0.00	72.1	0.62	-	1.33	-0.02	81.9	193.2	83.4	78.0
300	52.365	0.178	0.079	0.00	72.1	0.63	101	1.33	0.00	81.8	193.0	83.4	77.8
301			0.080	0.00	72.1	0.62	-	1.31	-0.02	81.9	192.7	83.5	77.8
302			0.079	0.00	72.2	0.62	-	1.30	-0.02	81.8	192.8	83.5	77.9
303			0.079	0.00	72.1	0.62	-	1.28	-0.02	81.8	192.8	83.5	77.9
304			0.080	0.00	72.1	0.62	-	1.27	-0.01	81.8	192.6	83.4	77.8
305			0.080	0.00	72.1	0.63	-	1.26	-0.01	81.8	192.7	83.6	77.6
306			0.080	0.00	72.1	0.63	-	1.25	-0.01	81.8	192.5	83.6	77.6
307			0.079	0.00	72.1	0.62	-	1.24	-0.01	81.8	192.5	83.6	77.7
308			0.080	0.00	72.1	0.62	-	1.23	-0.02	81.8	192.4	83.6	78.2
309			0.081	0.00	72.0	0.62	-	1.21	-0.02	81.7	192.5	83.5	77.9
310	54.132	0.177	0.080	0.00	72.0	0.62	100	1.20	-0.01	81.8	192.5	83.6	78.0
311			0.079	0.00	72.0	0.62	-	1.19	-0.01	81.8	192.4	83.7	77.9
312			0.079	0.00	72.0	0.61	-	1.18	-0.01	81.7	192.2	83.7	77.9
313			0.080	0.00	72.0	0.63	-	1.17	0.00	81.6	192.0	83.7	77.6
314			0.080	0.00	72.0	0.63	-	1.16	-0.01	81.6	192.0	83.7	77.9
315			0.081	0.00	71.9	0.62	-	1.15	-0.02	81.6	191.8	83.6	77.6
316			0.079	0.00	71.8	0.63	-	1.14	-0.01	81.6	191.8	83.7	77.7
317			0.080	0.00	71.9	0.62	-	1.12	-0.01	81.5	191.6	83.7	77.5
318			0.081	0.00	71.8	0.62	-	1.11	-0.01	81.5	191.5	83.6	77.8
319			0.080	0.00	71.9	0.62	-	1.10	-0.01	81.4	191.4	83.7	77.7
320	55.886	0.175	0.080	0.00	71.9	0.63	99	1.09	-0.01	81.5	191.2	83.7	77.5
321			0.080	0.00	71.8	0.64	-	1.08	-0.01	81.4	191.2	83.7	77.6
322			0.080	0.00	71.8	0.65	-	1.07	-0.01	81.4	191.2	83.8	77.7
323			0.080	0.00	71.8	0.65	-	1.06	-0.01	81.4	191.1	83.9	77.7
324			0.080	0.00	71.8	0.64	-	1.04	-0.02	81.4	190.8	83.9	77.5
325			0.080	0.00	71.8	0.65	-	1.04	0.00	81.4	190.7	83.9	77.4
326			0.079	0.00	71.9	0.64	-	1.03	-0.01	81.4	190.3	83.8	77.5
327			0.080	0.00	72.0	0.64	-	1.02	-0.01	81.3	190.1	83.7	77.5
328			0.079	0.00	72.0	0.65	-	1.00	-0.01	81.2	190.1	83.6	77.5
329			0.078	0.00	71.9	0.65	-	0.99	-0.01	81.3	189.7	83.6	77.6

# BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	57.657	0.177	0.080	0.00	72.0	0.65	100	0.98	0.00	81.3	189.6	83.6	77.4
331			0.079	0.00	71.9	0.64	-	0.98	0.00	81.3	189.5	83.6	77.4
332			0.079	0.00	71.9	0.64	-	0.96	-0.02	81.2	189.5	83.4	77.2
333			0.080	0.00	71.9	0.66	-	0.95	-0.01	81.2	189.3	83.4	77.1
334			0.081	0.00	71.8	0.65	-	0.94	-0.01	81.1	189.0	83.4	77.3
335			0.079	0.00	71.9	0.64	-	0.93	-0.01	81.1	188.9	83.4	77.4
336			0.080	0.00	71.9	0.65	-	0.92	-0.01	81.1	188.7	83.4	77.1
337			0.081	0.00	71.9	0.65	-	0.91	0.00	81.0	188.3	83.4	77.2
338			0.080	0.00	71.9	0.64	-	0.90	-0.02	81.0	188.3	83.2	77.5
339			0.080	0.00	71.8	0.64	-	0.89	-0.01	81.1	188.0	83.3	77.3
340	59.429	0.177	0.080	0.00	71.9	0.65	100	0.88	-0.01	81.0	187.9	83.3	77.4
341			0.079	0.00	71.8	0.65	-	0.87	-0.01	81.0	187.8	83.3	77.4
342			0.079	0.00	71.8	0.65	-	0.86	-0.01	80.9	187.3	83.4	77.2
343			0.079	0.00	71.8	0.65	-	0.83	-0.02	80.9	186.9	83.4	77.1
344			0.079	0.00	71.8	0.65	-	0.83	-0.01	80.9	186.6	83.5	77.2
345			0.079	0.00	71.8	0.64	-	0.82	-0.01	80.8	186.3	83.4	77.3
346			0.079	0.00	71.8	0.64	-	0.81	-0.01	80.7	185.9	83.4	77.0
347			0.078	0.00	71.8	0.64	-	0.80	-0.02	80.7	185.6	83.3	77.1
348			0.079	0.00	71.8	0.64	-	0.79	-0.01	80.7	185.6	83.2	77.1
349			0.079	0.00	71.8	0.64	-	0.79	0.00	80.7	185.4	83.3	77.2
350	61.189	0.176	0.079	0.00	71.8	0.64	100	0.78	-0.01	80.6	185.1	83.2	77.0
351			0.079	0.00	71.7	0.65	-	0.76	-0.01	80.7	184.8	83.2	77.3
352			0.079	0.00	71.8	0.65	-	0.77	0.00	80.7	184.4	83.2	77.2
353			0.080	0.00	71.7	0.66	-	0.76	-0.01	80.6	184.2	83.2	77.1
354			0.079	0.00	71.8	0.64	-	0.74	-0.01	80.5	183.9	83.1	76.9
355			0.079	0.00	71.8	0.65	-	0.73	-0.01	80.6	183.5	83.1	77.1
356			0.079	0.00	71.7	0.64	-	0.72	-0.01	80.5	183.3	83.1	77.2
357			0.079	0.00	71.7	0.65	-	0.72	-0.01	80.5	183.3	83.1	76.9
358			0.079	0.00	71.8	0.66	-	0.70	-0.01	80.5	182.9	83.1	77.2
359			0.080	0.00	71.8	0.66	-	0.70	0.00	80.5	183.2	83.1	77.1
360	62.944	0.176	0.079	0.00	71.8	0.66	100	0.68	-0.02	80.5	183.3	83.1	76.9
361			0.080	0.00	71.7	0.67	-	0.67	-0.01	80.4	183.1	83.1	76.7
362			0.080	0.00	71.7	0.68	-	0.66	-0.01	80.4	182.8	83.3	77.0

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363			0.080	0.00	71.8	0.68	-	0.64	-0.02	80.3	182.6	83.3	77.0
364			0.080	0.00	71.8	0.68	-	0.63	-0.01	80.3	182.7	83.2	76.9
365			0.080	0.00	71.9	0.69	-	0.63	0.00	80.3	182.8	83.0	76.9
366			0.079	0.00	72.0	0.69	-	0.62	-0.01	80.3	182.7	83.1	77.0
367			0.079	0.00	71.9	0.67	-	0.60	-0.02	80.2	182.7	83.1	76.9
368			0.079	0.00	72.0	0.68	-	0.59	-0.02	80.2	182.6	83.1	76.8
369			0.079	0.00	72.0	0.68	-	0.58	-0.01	80.2	182.4	83.0	76.9
370	64.716	0.177	0.079	0.00	72.0	0.68	100	0.58	0.01	80.2	182.3	83.0	76.9
371			0.079	0.00	71.9	0.67	-	0.57	-0.01	80.2	182.0	83.0	77.0
372			0.081	0.00	71.9	0.69	-	0.56	-0.01	80.2	181.6	83.0	77.1
373			0.080	0.00	72.0	0.69	-	0.54	-0.01	80.1	181.7	83.0	77.0
374			0.080	0.00	72.0	0.69	-	0.54	0.00	80.1	181.5	83.0	77.1
375			0.080	0.00	72.0	0.70	-	0.53	-0.01	80.1	181.3	83.0	77.1
376			0.080	0.00	72.1	0.72	-	0.52	-0.01	80.1	181.1	83.0	77.2
377			0.081	0.00	72.1	0.72	-	0.51	-0.01	80.1	181.0	83.0	77.0
378			0.080	0.00	72.1	0.72	-	0.51	-0.01	80.1	180.8	83.0	77.0
379			0.079	0.00	72.1	0.72	-	0.50	-0.01	80.0	180.7	82.9	76.9
380	66.465	0.175	0.080	0.00	72.1	0.72	99	0.49	-0.01	80.0	180.5	83.0	77.0
381			0.079	0.00	72.1	0.74	-	0.48	-0.01	80.0	180.2	83.0	76.7
382			0.081	0.00	72.0	0.73	-	0.48	0.00	80.0	180.0	83.0	77.0
383			0.081	0.00	72.1	0.74	-	0.47	-0.01	79.9	179.7	82.9	76.7
384			0.079	0.00	72.1	0.74	-	0.46	-0.01	79.9	179.6	83.0	77.0
385			0.081	0.00	72.1	0.74	-	0.45	-0.01	79.9	179.6	83.0	76.5
386			0.080	0.00	72.0	0.74	-	0.44	-0.01	79.9	179.5	82.9	76.6
387			0.081	0.00	72.1	0.73	-	0.44	0.00	79.8	179.3	82.9	76.9
388			0.080	0.00	72.2	0.74	-	0.42	-0.01	79.8	179.0	82.9	76.9
389			0.080	0.00	72.2	0.74	-	0.42	0.00	79.8	178.8	83.0	77.1
390	68.228	0.176	0.080	0.00	72.3	0.74	99	0.40	-0.02	79.7	178.5	82.9	76.8
391			0.078	0.00	72.3	0.74	-	0.41	0.00	79.6	178.5	82.8	76.8
392			0.074	0.00	72.4	0.74	-	0.39	-0.01	79.7	178.4	82.9	77.0
393			0.081	0.00	72.4	0.74	-	0.38	-0.01	79.6	178.1	83.0	77.1
394			0.080	0.00	72.4	0.75	-	0.37	-0.02	79.6	178.1	82.9	76.9
395			0.079	0.00	72.5	0.74	-	0.37	0.00	79.6	178.1	82.8	76.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396			0.079	0.00	72.5	0.75	-	0.36	-0.01	79.6	177.8	82.9	76.8
397			0.080	0.00	72.5	0.75	-	0.35	0.00	79.7	177.6	82.9	76.7
398			0.081	0.00	72.4	0.75	-	0.34	-0.01	79.7	177.5	83.0	76.8
399			0.079	0.00	72.5	0.74	-	0.33	-0.01	79.6	177.3	82.9	76.8
400	69.976	0.175	0.079	0.00	72.5	0.76	99	0.32	0.00	79.6	177.0	82.9	76.9
401			0.079	0.00	72.4	0.78	-	0.32	-0.01	79.6	176.6	82.9	76.8
402			0.079	0.00	72.5	0.79	-	0.31	-0.01	79.6	176.5	82.9	76.8
403			0.079	0.00	72.4	0.79	-	0.30	-0.01	79.6	176.5	82.8	76.8
404			0.079	0.00	72.4	0.79	-	0.30	0.00	79.5	176.3	82.7	76.7
405			0.079	0.00	72.4	0.78	-	0.29	-0.01	79.4	176.0	82.7	76.6
406			0.081	0.00	72.3	0.79	-	0.28	-0.01	79.4	176.0	82.8	76.8
407			0.080	0.00	72.4	0.80	-	0.27	-0.01	79.4	175.7	82.8	76.8
408			0.079	0.00	72.4	0.79	-	0.26	0.00	79.4	175.6	82.7	76.8
409			0.079	0.00	72.3	0.80	-	0.25	-0.01	79.4	175.4	82.6	76.7
410	71.739	0.176	0.079	0.00	72.3	0.79	100	0.24	-0.01	79.3	175.2	82.5	76.6
411			0.080	0.00	72.3	0.80	-	0.24	-0.01	79.3	175.2	82.5	76.7
412			0.081	0.00	72.2	0.79	-	0.23	0.00	79.3	174.8	82.6	76.6
413			0.079	0.00	72.1	0.81	-	0.22	-0.01	79.2	174.7	82.8	76.7
414			0.079	0.00	72.2	0.81	-	0.22	-0.01	79.3	174.6	83.4	76.4
415			0.081	0.00	72.2	0.81	-	0.21	-0.01	79.2	174.4	84.0	76.6
416			0.079	0.00	72.2	0.82	-	0.20	-0.01	79.3	174.2	84.6	76.5
417			0.080	0.00	72.2	0.81	-	0.19	-0.01	79.3	174.0	85.0	76.6
418			0.079	0.00	72.2	0.82	-	0.19	0.00	79.2	173.8	85.5	76.7
419			0.080	0.00	72.2	0.81	-	0.18	-0.01	79.2	173.8	86.1	76.6
420	73.507	0.177	0.079	0.00	72.1	0.82	100	0.17	-0.01	79.2	173.6	86.6	76.6
421			0.079	0.00	72.1	0.82	-	0.16	-0.01	79.1	173.3	86.7	76.6
422			0.080	0.00	72.1	0.83	-	0.16	0.00	79.1	172.8	86.4	76.6
423			0.080	0.00	72.1	0.83	-	0.15	-0.01	79.1	172.4	86.1	76.5
424			0.079	0.00	72.1	0.82	-	0.15	0.00	79.1	172.2	85.8	76.4
425			0.080	0.00	72.1	0.82	-	0.15	0.00	79.0	171.7	85.6	76.6
426			0.080	0.00	72.1	0.82	-	0.14	-0.01	79.0	171.4	85.2	76.5
427			0.080	0.00	72.1	0.81	-	0.13	-0.01	78.9	170.9	84.9	76.6
428			0.079	0.00	72.1	0.83	-	0.12	0.00	79.0	170.7	84.8	76.5

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
429			0.080	0.00	72.1	0.82	-	0.12	0.00	78.9	170.4	84.6	76.5
430	75.261	0.175	0.080	0.00	72.1	0.84	99	0.11	-0.01	78.9	169.9	84.3	76.4
431			0.080	0.00	72.2	0.83	-	0.11	0.00	78.9	169.5	84.1	76.4
432			0.079	0.00	72.1	0.84	-	0.10	-0.01	78.8	169.3	83.9	76.5
433			0.080	0.00	72.1	0.82	-	0.09	-0.01	78.8	168.8	83.9	76.4
434			0.080	0.00	72.1	0.83	-	0.09	-0.01	78.9	168.4	83.8	76.5
435			0.080	0.00	72.1	0.84	-	0.08	-0.01	78.8	167.9	83.7	76.5
436			0.080	0.00	72.1	0.84	-	0.07	-0.01	78.7	167.6	83.5	76.5
437			0.080	0.00	72.1	0.84	-	0.07	0.00	78.8	167.2	83.5	76.5
438			0.079	0.00	72.2	0.84	-	0.07	0.00	78.7	166.9	83.3	76.4
439			0.080	0.00	72.1	0.85	-	0.06	-0.01	78.6	166.5	83.3	76.3
440	77.006	0.175	0.080	0.00	72.1	0.85	98	0.06	0.00	78.7	166.1	83.2	76.6
441			0.079	0.00	72.0	0.87	-	0.04	-0.01	78.6	165.7	83.2	76.5
442			0.080	0.00	72.0	0.86	-	0.04	0.00	78.5	165.3	83.1	76.6
443			0.080	0.00	71.9	0.86	-	0.03	-0.01	78.5	165.0	83.1	76.6
444			0.080	0.00	71.9	0.87	-	0.04	0.01	78.5	164.8	83.1	76.5
445			0.081	0.00	71.9	0.87	-	0.02	-0.02	78.4	164.6	83.0	76.1
446			0.080	0.00	72.0	0.88	-	0.03	0.01	78.4	164.4	83.0	76.3
447			0.079	0.00	72.0	0.88	-	0.01	-0.01	78.4	164.0	82.9	76.3
448			0.080	0.00	72.0	0.88	-	0.00	-0.01	78.4	163.6	82.9	76.2
449			0.079	0.00	72.0	0.89	-	0.00	0.00	78.3	163.3	82.8	76.3
450	78.773	0.177	0.081	0.00	71.3	0.89	99	0.00	0.00	76.3	158.0	82.8	75.0
Avg/Tot	78.773	0.175	0.079	0.00	72.5	0.56	100			88.6	269.4	84.0	79.6

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	71.6	0.47		89.5	-0.076	2.20	0.087	11.3	46.4
1			0.00	71.6	0.37	-	89.1	-0.080	2.09	0.176	10.3	50.9
2			0.00	71.7	0.45	-	88.1	-0.101	3.49	0.163	11.9	54.9
3			0.00	71.8	0.37	-	88.4	-0.097	5.69	0.277	11.8	54.7
4			0.00	71.8	0.42	-	86.2	-0.099	12.96	0.105	11.1	53.1
5			0.00	71.8	0.38	-	85.8	-0.100	12.86	0.057	15.9	63.0
6			0.00	71.9	0.46	-	86.1	-0.099	13.58	0.139	17.7	64.6
7			0.00	71.9	0.46	-	86.6	-0.098	12.49	0.109	18.5	63.3
8			0.00	71.9	0.37	-	86.7	-0.097	12.34	0.148	17.8	63.3
9			0.00	71.9	0.45	-	87.0	-0.097	12.43	0.164	19.1	62.1
10	1.740	0.174	0.00	71.9	0.41	104	87.1	-0.097	12.61	0.230	19.6	61.9
11			0.00	72.0	0.39	-	87.2	-0.097	12.32	0.145	19.8	61.2
12			0.00	72.0	0.46	-	87.3	-0.101	12.04	0.122	19.8	61.2
13			0.00	72.0	0.46	-	87.6	-0.099	12.48	0.359	19.7	60.8
14			0.00	72.1	0.38	-	86.2	-0.097	13.38	0.423	17.9	62.4
15			0.00	72.1	0.36	-	85.4	-0.094	13.76	0.366	18.8	62.2
16			0.00	72.1	0.35	-	85.1	-0.093	13.36	0.240	19.4	60.4
17			0.00	72.1	0.40	-	84.7	-0.089	10.61	0.195	19.4	59.4
18			0.00	72.1	0.46	-	84.4	-0.088	10.21	0.271	19.7	56.3
19			0.00	72.1	0.39	-	83.9	-0.089	11.09	0.337	20.2	55.2
20	3.447	0.171	0.00	72.1	0.37	101	84.0	-0.088	11.17	0.303	20.4	55.8
21			0.00	72.1	0.39	-	83.8	-0.088	11.41	0.293	19.2	56.7
22			0.00	72.2	0.44	-	83.7	-0.088	11.57	0.341	19.1	56.7
23			0.00	72.1	0.44	-	83.5	-0.086	11.68	0.375	19.1	56.5
24			0.00	72.2	0.41	-	83.6	-0.087	11.75	0.364	19.1	56.3
25			0.00	72.3	0.44	-	83.5	-0.087	11.91	0.325	18.9	56.5
26			0.00	72.3	0.37	-	83.5	-0.087	11.80	0.259	18.9	56.1
27			0.00	72.4	0.42	-	83.4	-0.087	11.79	0.252	19.2	55.9
28			0.00	72.4	0.41	-	83.3	-0.087	11.89	0.298	19.6	55.6
29			0.00	72.4	0.44	-	83.2	-0.087	12.06	0.343	19.8	55.6
30	5.161	0.171	0.00	72.4	0.43	100	83.2	-0.087	12.27	0.382	20.0	55.4
31			0.00	72.4	0.44	-	82.9	-0.087	12.48	0.451	20.2	55.4
32			0.00	72.4	0.38	-	82.8	-0.087	12.52	0.478	20.4	55.4
33			0.00	72.4	0.43	-	82.9	-0.087	12.69	0.535	20.7	55.8
34			0.00	72.3	0.43	-	82.9	-0.087	12.67	0.475	20.7	55.6
35			0.00	72.3	0.37	-	82.8	-0.087	12.66	0.434	20.9	55.4
36			0.00	72.3	0.35	-	82.7	-0.088	13.32	0.398	21.4	55.2
37			0.00	72.3	0.39	-	82.7	-0.089	13.44	0.541	21.7	55.2
38			0.00	72.4	0.44	-	82.7	-0.089	13.83	0.572	22.0	55.4

Data from 12/20/22 testing - Reference Only



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	72.4	0.44	-	82.6	-0.089	14.13	0.580	22.2	55.6
40	6.868	0.171	0.00	72.4	0.45	99	82.6	-0.090	14.36	0.617	22.4	55.8
41			0.00	72.4	0.45	-	82.6	-0.090	14.06	0.671	22.6	55.9
42			0.00	72.4	0.41	-	82.7	-0.089	14.15	0.547	22.6	55.9
43			0.00	72.4	0.38	-	82.6	-0.089	14.26	0.466	22.5	55.6
44			0.00	72.4	0.42	-	82.6	-0.090	14.36	0.472	22.5	55.6
45			0.00	72.4	0.38	-	82.4	-0.089	14.06	0.429	22.5	55.6
46			0.00	72.4	0.44	-	82.2	-0.089	13.87	0.545	22.4	55.4
47			0.00	72.4	0.41	-	82.2	-0.089	13.94	0.524	22.4	55.2
48			0.00	72.4	0.43	-	82.3	-0.089	14.06	0.454	22.4	55.2
49			0.00	72.4	0.46	-	82.2	-0.089	14.29	0.350	22.4	55.2
50	8.607	0.174	0.00	72.5	0.44	101	82.2	-0.090	14.03	0.344	22.5	55.2
51			0.00	72.4	0.44	-	82.1	-0.089	14.02	0.296	22.4	55.0
52			0.00	72.4	0.37	-	82.1	-0.090	14.20	0.216	22.3	54.9
53			0.00	72.3	0.40	-	82.1	-0.090	14.33	0.196	22.3	54.9
54			0.00	72.3	0.44	-	82.3	-0.089	14.11	0.246	22.3	54.9
55			0.00	72.4	0.47	-	82.7	-0.089	13.96	0.233	22.2	54.5
56			0.00	72.4	0.44	-	83.0	-0.088	14.09	0.267	22.1	54.5
57			0.00	72.5	0.43	-	83.5	-0.089	14.05	0.305	22.1	54.3
58			0.00	72.5	0.44	-	83.9	-0.089	13.96	0.354	22.2	54.3
59			0.00	72.5	0.47	-	84.2	-0.090	14.03	0.382	22.2	54.3
60	10.337	0.173	0.00	72.5	0.45	101	84.5	-0.088	13.85	0.452	22.2	54.3
61			0.00	72.5	0.52	-	84.6	-0.088	13.82	0.445	22.2	54.3
62			0.00	72.5	0.53	-	84.9	-0.089	13.77	0.483	22.1	54.1
63			0.00	72.6	0.59	-	85.3	-0.089	13.75	0.425	21.9	54.0
64			0.00	72.6	0.61	-	85.6	-0.088	13.74	0.388	21.8	53.8
65			0.00	72.7	0.56	-	85.9	-0.088	13.77	0.421	21.8	53.6
66			0.00	72.7	0.61	-	86.2	-0.088	13.47	0.599	21.8	53.4
67			0.00	72.7	0.57	-	86.4	-0.088	13.62	0.592	21.8	53.2
68			0.00	72.7	0.64	-	86.4	-0.087	13.75	0.702	21.9	53.6
69			0.00	72.8	0.57	-	86.6	-0.088	13.86	0.741	22.1	53.4
70	12.066	0.173	0.00	72.8	0.63	100	87.0	-0.087	14.01	0.675	22.1	53.4
71			0.00	72.8	0.64	-	87.4	-0.087	13.86	0.671	22.0	53.4
72			0.00	72.8	0.63	-	87.7	-0.087	13.74	0.635	22.0	53.2
73			0.00	72.8	0.66	-	87.6	-0.086	13.73	0.660	21.9	53.1
74			0.00	72.8	0.66	-	87.4	-0.086	13.29	0.516	21.9	52.9
75			0.00	72.9	0.63	-	87.3	-0.085	13.15	0.450	21.5	52.5
76			0.00	72.9	0.67	-	87.3	-0.085	12.87	0.461	21.6	52.2
77			0.00	72.9	0.69	-	87.1	-0.085	12.80	0.405	21.5	52.0

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	73.0	0.66	-	87.2	-0.084	12.69	0.375	21.4	51.8
79			0.00	72.9	0.65	-	87.1	-0.083	12.62	0.341	21.5	51.4
80	13.803	0.174	0.00	72.9	0.67	100	87.1	-0.083	12.49	0.362	21.4	51.4
81			0.00	72.8	0.65	-	87.0	-0.084	12.48	0.319	21.5	51.3
82			0.00	72.8	0.72	-	86.8	-0.084	12.39	0.355	21.5	51.3
83			0.00	72.7	0.68	-	86.7	-0.084	12.46	0.345	21.4	50.9
84			0.00	72.7	0.68	-	86.6	-0.083	12.54	0.359	21.5	50.9
85			0.00	72.6	0.68	-	86.4	-0.084	12.49	0.389	21.4	50.7
86			0.00	72.5	0.67	-	86.3	-0.083	12.53	0.381	21.4	50.7
87			0.00	72.4	0.66	-	86.2	-0.083	12.67	0.373	21.4	50.7
88			0.00	72.4	0.69	-	86.0	-0.084	12.71	0.404	21.5	50.7
89			0.00	72.4	0.73	-	86.0	-0.083	12.82	0.425	21.6	50.5
90	15.550	0.175	0.00	72.4	0.73	101	85.9	-0.083	12.89	0.494	21.6	50.5
91			0.00	72.4	0.74	-	85.8	-0.084	13.04	0.497	21.5	50.7
92			0.00	72.4	0.67	-	85.7	-0.083	13.25	0.482	21.5	50.7
93			0.00	72.3	0.71	-	85.7	-0.084	13.27	0.501	21.7	50.7
94			0.00	72.3	0.74	-	85.7	-0.084	13.22	0.509	21.5	50.7
95			0.00	72.4	0.69	-	85.8	-0.084	13.14	0.536	20.9	50.9
96			0.00	72.4	0.75	-	85.7	-0.083	13.20	0.460	20.4	51.1
97			0.00	72.3	0.73	-	85.8	-0.083	12.87	0.538	20.2	51.1
98			0.00	72.3	0.69	-	85.8	-0.082	12.67	0.540	19.9	50.9
99			0.00	72.3	0.75	-	85.8	-0.083	12.67	0.511	19.7	50.9
100	17.298	0.175	0.00	72.2	0.74	101	85.7	-0.082	12.53	0.491	19.6	50.7
101			0.00	72.2	0.70	-	85.8	-0.082	11.98	0.260	19.3	50.5
102			0.00	72.2	0.74	-	85.7	-0.080	11.70	0.058	18.7	50.0
103			0.00	72.1	0.70	-	85.6	-0.079	10.73	0.021	18.3	49.1
104			0.00	72.1	0.77	-	85.7	-0.078	10.19	0.036	18.0	48.2
105			0.00	72.1	0.70	-	85.6	-0.078	9.85	0.068	17.7	47.7
106			0.00	72.1	0.72	-	85.5	-0.078	9.61	0.071	17.6	47.5
107			0.00	72.1	0.74	-	85.2	-0.077	9.47	0.080	17.4	46.9
108			0.00	72.2	0.73	-	85.3	-0.076	9.38	0.107	17.3	46.8
109			0.00	72.2	0.70	-	85.1	-0.076	9.25	0.092	17.3	46.6
110	19.041	0.174	0.00	72.1	0.77	102	84.9	-0.074	9.02	0.104	17.1	46.2
111			0.00	72.1	0.76	-	84.9	-0.072	7.85	0.201	17.0	45.9
112			0.00	72.0	0.76	-	85.0	-0.070	6.96	0.403	16.6	45.0
113			0.00	72.0	0.71	-	85.0	-0.069	5.47	1.009	16.2	44.1
114			0.00	71.9	0.76	-	85.0	-0.067	5.74	0.991	15.9	43.2
115			0.00	72.0	0.70	-	84.9	-0.067	5.65	1.058	15.9	43.2
116			0.00	71.9	0.78	-	84.8	-0.066	5.65	1.067	16.0	42.8

Data from 12/20/22 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.00	71.9	0.72	-	84.7	-0.064	5.60	1.103	16.1	42.6
118			0.00	71.9	0.80	-	84.4	-0.064	5.78	1.059	16.2	42.6
119			0.00	71.8	0.74	-	84.3	-0.063	5.84	1.064	16.4	42.6
120	20.776	0.173	0.00	71.9	0.81	100	84.1	-0.063	5.65	1.100	16.7	42.4
121			0.00	71.9	0.85	-	84.2	-0.062	5.89	1.242	16.7	42.3
122			0.00	71.9	0.82	-	84.1	-0.062	6.44	1.048	16.8	42.3
123			0.00	71.9	0.89	-	84.1	-0.061	6.21	1.125	17.0	42.4
124			0.00	71.9	0.87	-	84.1	-0.060	6.50	1.038	16.9	42.3
125			0.00	71.9	0.89	-	83.9	-0.060	6.71	1.017	17.3	41.9
126			0.00	71.9	0.95	-	83.8	-0.060	6.61	0.989	17.6	41.9
127			0.00	72.0	1.01	-	83.7	-0.060	6.40	1.117	17.7	41.7
128			0.00	72.0	1.08	-	83.7	-0.060	6.41	1.115	17.7	41.7
129			0.00	72.0	1.09	-	83.4	-0.059	6.28	1.074	17.8	41.7
130	22.518	0.174	0.00	72.0	1.12	100	83.4	-0.059	6.36	1.030	17.8	41.5
131			0.00	72.0	1.20	-	83.4	-0.058	5.95	1.136	17.7	41.4
132			0.00	72.0	1.17	-	83.4	-0.058	5.85	1.072	17.5	41.0
133			0.00	72.1	1.15	-	83.3	-0.058	5.86	1.024	17.5	40.8
134			0.00	72.0	1.15	-	83.2	-0.057	5.87	1.008	17.4	40.5
135			0.00	72.0	1.16	-	83.2	-0.056	5.82	0.977	17.4	40.5
136			0.00	72.1	1.11	-	83.3	-0.056	5.86	0.997	17.4	40.3
137			0.00	72.1	1.18	-	83.2	-0.055	5.85	0.983	17.4	40.3
138			0.00	72.1	1.16	-	83.3	-0.055	5.87	0.993	17.5	40.1
139			0.00	72.1	1.14	-	83.3	-0.055	5.75	0.961	17.6	40.1
140	24.261	0.174	0.00	72.1	1.12	100	83.2	-0.055	5.79	0.967	17.6	39.9
141			0.00	72.1	1.09	-	83.3	-0.055	5.75	0.953	17.6	40.1
142			0.00	72.0	1.14	-	83.3	-0.054	5.62	0.928	17.3	40.3
143			0.00	72.1	1.14	-	83.2	-0.053	5.68	0.940	16.9	40.5
144			0.00	72.1	1.10	-	83.1	-0.053	5.58	0.969	17.0	40.5
145			0.00	72.1	1.06	-	83.2	-0.053	5.57	0.993	17.0	40.3
146			0.00	72.0	1.08	-	83.1	-0.052	5.59	0.992	17.1	40.3
147			0.00	72.0	1.10	-	83.1	-0.052	5.61	0.982	17.3	40.3
148			0.00	72.0	1.11	-	82.9	-0.052	5.56	0.959	17.3	40.3
149			0.00	72.0	1.11	-	82.9	-0.052	5.62	0.961	17.6	40.1
150	26.025	0.176	0.00	72.0	1.09	101	82.9	-0.052	5.58	0.950	17.8	39.9
151			0.00	72.0	1.10	-	82.9	-0.052	5.62	0.952	17.8	39.9
152			0.00	72.0	1.07	-	82.9	-0.051	5.66	0.949	17.8	39.9
153			0.00	72.0	1.11	-	82.9	-0.050	5.64	0.939	17.8	39.9
154			0.00	72.0	1.09	-	82.8	-0.051	5.59	0.923	17.8	39.7
155			0.00	72.0	1.09	-	82.9	-0.050	5.56	0.916	17.8	39.7

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
156			0.00	72.0	1.03	-	82.9	-0.050	5.56	0.908	17.7	39.9
157			0.00	72.0	1.07	-	82.9	-0.050	5.60	0.916	17.7	39.7
158			0.00	72.1	1.05	-	82.7	-0.049	5.60	0.922	17.8	39.7
159			0.00	72.1	1.03	-	82.7	-0.049	5.51	0.895	17.8	39.7
160	27.787	0.176	0.00	72.1	1.08	100	82.6	-0.049	5.56	0.906	17.9	39.6
161			0.00	72.1	1.08	-	82.5	-0.049	5.28	0.947	18.3	39.6
162			0.00	72.1	1.06	-	82.4	-0.049	5.22	0.929	18.5	39.4
163			0.00	72.1	1.03	-	82.2	-0.049	5.20	0.909	18.6	39.2
164			0.00	72.1	1.02	-	82.1	-0.048	5.20	0.902	18.8	39.2
165			0.00	72.1	1.08	-	82.0	-0.048	5.18	0.891	18.9	39.2
166			0.00	72.1	1.07	-	82.1	-0.048	5.14	0.879	19.0	39.0
167			0.00	72.1	1.03	-	82.1	-0.048	5.13	0.876	19.1	39.0
168			0.00	72.1	1.09	-	82.7	-0.047	5.16	0.879	19.1	39.0
169			0.00	72.1	1.04	-	83.0	-0.047	5.13	0.870	19.1	38.8
170	29.553	0.177	0.00	72.2	1.09	99	83.4	-0.047	5.15	0.869	19.2	38.8
171			0.00	72.1	1.04	-	83.7	-0.047	5.12	0.866	19.2	38.8
172			0.00	72.0	1.02	-	83.9	-0.046	5.14	0.864	19.3	38.7
173			0.00	71.9	1.01	-	84.0	-0.047	5.16	0.863	19.4	38.7
174			0.00	72.0	1.04	-	84.2	-0.046	5.13	0.853	19.4	38.7
175			0.00	72.0	1.09	-	84.4	-0.046	5.11	0.851	19.5	38.7
176			0.00	72.0	1.05	-	84.4	-0.045	5.14	0.860	19.5	38.7
177			0.00	71.9	1.05	-	84.8	-0.046	5.08	0.843	19.7	38.7
178			0.00	71.8	1.09	-	85.0	-0.046	5.08	0.839	19.6	38.7
179			0.00	71.9	1.05	-	85.1	-0.046	5.10	0.840	19.4	38.7
180	31.321	0.177	0.00	71.9	1.05	99	85.1	-0.045	5.13	0.847	19.4	38.8
181			0.00	72.0	1.09	-	85.3	-0.046	5.09	0.834	19.4	38.8
182			0.00	72.0	1.09	-	85.5	-0.045	5.08	0.832	19.3	38.7
183			0.00	72.0	1.06	-	85.7	-0.045	5.07	0.827	19.3	38.7
184			0.00	72.1	1.08	-	85.8	-0.045	5.08	0.827	19.2	38.7
185			0.00	72.0	1.09	-	86.0	-0.045	5.07	0.824	19.3	38.7
186			0.00	72.1	1.07	-	86.0	-0.045	5.04	0.816	19.2	38.7
187			0.00	72.1	1.07	-	86.0	-0.044	5.09	0.824	19.3	38.7
188			0.00	72.1	1.08	-	86.2	-0.045	5.04	0.818	19.3	38.7
189			0.00	72.1	1.04	-	86.2	-0.044	5.08	0.818	19.3	38.7
190	33.083	0.176	0.00	72.1	1.09	99	86.4	-0.044	5.07	0.815	19.3	38.5
191			0.00	72.1	1.11	-	86.5	-0.045	5.04	0.822	19.3	38.5
192			0.00	72.1	1.05	-	86.6	-0.044	5.06	0.827	19.3	38.5
193			0.00	72.1	1.03	-	86.7	-0.044	5.04	0.821	19.3	38.5
194			0.00	72.1	1.10	-	86.7	-0.044	5.01	0.814	19.3	38.5

Data from 12/20/22 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
195			0.00	72.0	1.05	-	86.6	-0.044	5.03	0.813	19.4	38.5
196			0.00	72.0	1.05	-	86.7	-0.044	5.04	0.810	19.4	38.5
197			0.00	72.0	1.10	-	86.4	-0.044	5.01	0.804	19.5	38.5
198			0.00	72.0	1.03	-	86.0	-0.043	5.01	0.800	19.5	38.5
199			0.00	72.0	1.04	-	85.7	-0.043	5.02	0.802	19.5	38.5
200	34.851	0.177	0.00	72.0	1.11	100	85.4	-0.044	4.98	0.795	19.5	38.5
201			0.00	72.0	1.04	-	85.0	-0.043	4.96	0.790	19.6	38.5
202			0.00	71.9	1.12	-	84.6	-0.043	5.00	0.795	19.6	38.5
203			0.00	72.0	1.10	-	84.3	-0.043	4.88	0.779	19.6	38.5
204			0.00	72.0	1.06	-	84.0	-0.043	4.82	0.763	19.7	38.5
205			0.00	72.0	1.13	-	83.9	-0.043	4.85	0.765	19.7	38.5
206			0.00	72.0	1.08	-	83.7	-0.043	4.85	0.758	19.7	38.5
207			0.00	71.9	1.11	-	83.4	-0.043	4.82	0.747	19.7	38.5
208			0.00	72.0	1.11	-	83.2	-0.043	4.81	0.748	19.7	38.3
209			0.00	72.0	1.08	-	82.9	-0.042	4.80	0.750	19.7	38.3
210	36.631	0.178	0.00	72.0	1.11	101	82.7	-0.042	4.76	0.747	19.8	38.3
211			0.00	72.0	1.04	-	82.8	-0.043	4.78	0.745	19.7	38.3
212			0.00	72.0	1.09	-	82.9	-0.042	4.76	0.744	19.8	38.3
213			0.00	72.0	1.12	-	83.1	-0.043	4.76	0.742	19.8	38.3
214			0.00	72.0	1.08	-	83.4	-0.042	4.74	0.740	19.8	38.3
215			0.00	72.0	1.05	-	83.6	-0.042	4.75	0.742	19.8	38.3
216			0.00	72.0	1.12	-	83.8	-0.042	4.76	0.742	19.8	38.3
217			0.00	72.0	1.11	-	84.1	-0.042	4.77	0.740	19.8	38.3
218			0.00	72.0	1.13	-	84.3	-0.042	4.80	0.741	19.9	38.3
219			0.00	72.0	1.06	-	84.4	-0.042	4.78	0.739	19.9	38.1
220	38.411	0.178	0.00	72.0	1.08	101	84.6	-0.042	4.77	0.737	19.9	38.1
221			0.00	72.0	1.09	-	84.8	-0.041	4.77	0.736	19.9	38.1
222			0.00	72.0	1.06	-	84.9	-0.042	4.77	0.730	19.9	38.1
223			0.00	72.0	1.06	-	84.7	-0.041	4.73	0.728	19.9	38.1
224			0.00	72.0	1.12	-	84.7	-0.041	4.73	0.725	19.9	38.1
225			0.00	72.0	1.10	-	84.7	-0.041	4.72	0.716	20.0	38.1
226			0.00	72.0	1.11	-	84.7	-0.041	4.63	0.708	20.0	38.1
227			0.00	72.0	1.08	-	84.6	-0.041	4.62	0.702	20.0	38.1
228			0.00	72.0	1.06	-	84.5	-0.041	4.63	0.701	20.0	38.1
229			0.00	71.9	1.09	-	84.4	-0.041	4.60	0.692	20.0	38.1
230	40.187	0.178	0.00	72.0	1.15	100	84.4	-0.041	4.63	0.702	20.0	37.9
231			0.00	72.0	1.14	-	84.3	-0.041	4.60	0.695	20.1	37.9
232			0.00	71.9	1.07	-	84.3	-0.041	4.61	0.689	20.1	37.9
233			0.00	72.0	1.08	-	84.2	-0.041	4.61	0.689	20.1	37.9

Data from 12/20/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
234			0.00	71.8	1.13	-	84.2	-0.041	4.61	0.688	20.1	37.9
235			0.00	71.8	1.12	-	84.2	-0.041	4.57	0.685	20.2	37.9
236			0.00	71.8	1.11	-	84.1	-0.041	4.61	0.690	20.1	37.9
237			0.00	71.7	1.13	-	84.1	-0.041	4.56	0.683	20.2	37.9
238			0.00	71.8	1.15	-	84.1	-0.041	4.57	0.680	20.2	37.9
239			0.00	71.8	1.14	-	84.1	-0.040	4.56	0.677	20.2	37.9
240	41.960	0.177	0.00	71.8	1.16	100	83.8	-0.041	4.56	0.676	20.2	37.9
241			0.00	71.7	1.09	-	83.7	-0.040	4.55	0.667	20.3	37.9
242			0.00	71.6	1.15	-	83.5	-0.040	4.56	0.670	20.3	37.9
243			0.00	71.7	1.08	-	83.3	-0.040	4.56	0.669	20.3	37.9
244			0.00	71.7	1.10	-	83.4	-0.040	4.55	0.663	20.4	37.9
245			0.00	71.7	1.09	-	83.5	-0.040	4.57	0.665	20.4	37.9
246			0.00	71.7	1.11	-	83.4	-0.040	4.56	0.661	20.3	37.9
247			0.00	71.7	1.15	-	83.5	-0.040	4.55	0.656	20.3	37.9
248			0.00	71.8	1.16	-	83.6	-0.040	4.55	0.653	20.3	37.8
249			0.00	71.7	1.15	-	83.6	-0.040	4.53	0.645	20.3	37.8
250	43.727	0.177	0.00	71.7	1.09	99	83.7	-0.040	4.53	0.642	20.3	37.8
251			0.00	71.7	1.11	-	83.8	-0.040	4.54	0.645	20.4	37.8
252			0.00	71.7	1.13	-	83.8	-0.040	4.52	0.636	20.4	37.8
253			0.00	71.7	1.16	-	83.8	-0.040	4.53	0.632	20.4	37.8
254			0.00	71.6	1.13	-	83.8	-0.040	4.52	0.631	20.4	37.8
255			0.00	71.6	1.12	-	83.9	-0.040	4.51	0.624	20.4	37.8
256			0.00	71.6	1.16	-	83.9	-0.040	4.56	0.626	20.4	37.8
257			0.00	71.6	1.17	-	83.8	-0.040	4.55	0.624	20.4	37.8
258			0.00	71.6	1.09	-	83.8	-0.039	4.51	0.604	20.4	37.8
259			0.00	71.6	1.14	-	83.7	-0.040	4.53	0.596	20.5	37.6
260	45.503	0.178	0.00	71.7	1.18	100	83.7	-0.039	4.53	0.593	20.5	37.8
261			0.00	71.7	1.16	-	83.5	-0.039	4.51	0.584	20.5	37.6
262			0.00	71.6	1.16	-	83.5	-0.039	4.56	0.575	20.6	37.6
263			0.00	71.6	1.15	-	83.5	-0.039	4.55	0.570	20.6	37.8
264			0.00	71.6	1.18	-	83.5	-0.039	4.54	0.565	20.6	37.8
265			0.00	71.7	1.15	-	83.5	-0.039	4.54	0.558	20.6	37.6
266			0.00	71.7	1.16	-	83.6	-0.039	4.53	0.558	20.6	37.6
267			0.00	71.7	1.12	-	83.6	-0.039	4.56	0.554	20.6	37.6
268			0.00	71.7	1.11	-	83.5	-0.039	4.55	0.552	20.6	37.6
269			0.00	71.7	1.17	-	83.6	-0.039	4.58	0.547	20.6	37.6
270	47.278	0.177	0.00	71.7	1.11	100	83.5	-0.039	4.58	0.549	20.6	37.6
271			0.00	71.6	1.15	-	83.6	-0.039	4.55	0.542	20.6	37.6
272			0.00	71.6	1.12	-	83.6	-0.039	4.58	0.541	20.7	37.6

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
273			0.00	71.7	1.12	-	83.6	-0.039	4.60	0.544	20.7	37.6
274			0.00	71.6	1.19	-	83.7	-0.039	4.60	0.540	20.7	37.6
275			0.00	71.6	1.14	-	83.8	-0.039	4.61	0.542	20.7	37.6
276			0.00	71.6	1.15	-	83.7	-0.039	4.62	0.537	20.7	37.6
277			0.00	71.6	1.13	-	83.7	-0.039	4.61	0.535	20.7	37.6
278			0.00	71.6	1.18	-	83.8	-0.039	4.62	0.531	20.7	37.6
279			0.00	71.6	1.20	-	83.8	-0.039	4.57	0.519	20.7	37.6
280	49.044	0.177	0.00	71.6	1.15	100	83.8	-0.039	4.60	0.522	20.8	37.6
281			0.00	71.6	1.15	-	83.7	-0.039	4.55	0.512	20.8	37.6
282			0.00	71.6	1.22	-	83.8	-0.039	4.59	0.514	20.8	37.6
283			0.00	71.7	1.23	-	83.9	-0.038	4.57	0.508	20.8	37.6
284			0.00	71.7	1.22	-	83.8	-0.039	4.57	0.505	20.8	37.4
285			0.00	71.7	1.23	-	83.7	-0.039	4.58	0.502	20.8	37.6
286			0.00	71.7	1.17	-	83.7	-0.039	4.60	0.506	20.7	37.6
287			0.00	71.7	1.24	-	83.8	-0.039	4.58	0.496	20.7	37.6
288			0.00	71.7	1.23	-	83.8	-0.038	4.59	0.499	20.7	37.6
289			0.00	71.7	1.20	-	83.7	-0.039	4.60	0.498	20.7	37.6
290	50.821	0.178	0.00	71.7	1.18	100	83.8	-0.039	4.56	0.495	20.7	37.6
291			0.00	71.7	1.17	-	83.8	-0.038	4.55	0.495	20.7	37.6
292			0.00	71.8	1.24	-	83.8	-0.038	4.56	0.492	20.7	37.4
293			0.00	71.8	1.23	-	83.8	-0.038	4.56	0.492	20.8	37.4
294			0.00	71.8	1.24	-	83.9	-0.038	4.55	0.487	20.8	37.4
295			0.00	71.7	1.25	-	83.8	-0.038	4.58	0.483	20.8	37.4
296			0.00	71.7	1.21	-	83.9	-0.038	4.58	0.482	20.7	37.4
297			0.00	71.7	1.18	-	83.8	-0.038	4.56	0.481	20.8	37.4
298			0.00	71.7	1.19	-	83.8	-0.038	4.58	0.479	20.7	37.4
299			0.00	71.6	1.18	-	83.7	-0.038	4.56	0.478	20.8	37.4
300	52.612	0.179	0.00	71.6	1.19	101	83.6	-0.038	4.56	0.479	20.8	37.4
301			0.00	71.6	1.21	-	83.6	-0.038	4.52	0.476	20.8	37.4
302			0.00	71.6	1.21	-	83.5	-0.038	4.53	0.477	20.8	37.4
303			0.00	71.6	1.21	-	83.6	-0.038	4.57	0.484	20.9	37.4
304			0.00	71.4	1.25	-	83.5	-0.038	4.56	0.482	20.8	37.4
305			0.00	71.4	1.24	-	83.6	-0.038	4.55	0.476	20.8	37.4
306			0.00	71.3	1.21	-	83.6	-0.038	4.55	0.474	20.9	37.4
307			0.00	71.2	1.19	-	83.5	-0.038	4.54	0.472	20.9	37.2
308			0.00	71.2	1.20	-	83.5	-0.038	4.56	0.479	20.9	37.2
309			0.00	71.2	1.23	-	83.5	-0.038	4.56	0.477	20.9	37.2
310	54.388	0.178	0.00	71.2	1.26	100	83.6	-0.038	4.54	0.471	20.9	37.2
311			0.00	71.3	1.27	-	83.6	-0.038	4.53	0.468	20.9	37.2

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
312			0.00	71.2	1.25	-	83.3	-0.038	4.52	0.465	20.9	37.2
313			0.00	71.3	1.24	-	83.4	-0.038	4.46	0.471	20.9	37.2
314			0.00	71.3	1.21	-	83.4	-0.038	4.47	0.473	20.9	37.2
315			0.00	71.2	1.22	-	83.3	-0.038	4.45	0.468	20.9	37.2
316			0.00	71.2	1.28	-	83.4	-0.038	4.42	0.462	20.9	37.2
317			0.00	71.3	1.25	-	83.4	-0.038	4.42	0.461	20.9	37.2
318			0.00	71.3	1.28	-	83.4	-0.037	4.43	0.457	20.9	37.0
319			0.00	71.3	1.24	-	83.4	-0.038	4.43	0.455	20.9	37.0
320	56.152	0.176	0.00	71.3	1.24	99	83.4	-0.038	4.51	0.463	20.9	37.0
321			0.00	71.3	1.29	-	83.4	-0.038	4.49	0.460	20.9	37.0
322			0.00	71.2	1.27	-	83.2	-0.037	4.50	0.459	21.0	37.0
323			0.00	71.2	1.30	-	83.2	-0.037	4.48	0.456	20.9	37.0
324			0.00	71.2	1.30	-	83.1	-0.038	4.48	0.451	20.9	37.0
325			0.00	71.3	1.31	-	83.2	-0.037	4.41	0.442	20.9	37.0
326			0.00	71.3	1.28	-	83.3	-0.037	4.40	0.440	20.9	37.0
327			0.00	71.3	1.24	-	83.3	-0.037	4.37	0.437	20.9	37.0
328			0.00	71.3	1.24	-	83.3	-0.037	4.36	0.437	20.9	37.0
329			0.00	71.3	1.24	-	83.3	-0.038	4.36	0.434	20.9	36.9
330	57.929	0.178	0.00	71.3	1.25	100	83.3	-0.038	4.33	0.432	20.9	37.0
331			0.00	71.3	1.28	-	83.3	-0.036	4.34	0.432	20.9	36.9
332			0.00	71.2	1.33	-	83.2	-0.037	4.34	0.430	20.9	36.9
333			0.00	71.3	1.27	-	83.3	-0.037	4.32	0.428	21.0	36.9
334			0.00	71.3	1.32	-	83.3	-0.037	4.32	0.425	21.0	36.9
335			0.00	71.3	1.31	-	83.2	-0.037	4.25	0.430	21.0	36.9
336			0.00	71.3	1.36	-	83.2	-0.037	4.27	0.434	21.0	37.0
337			0.00	71.3	1.32	-	83.2	-0.037	4.25	0.432	21.1	36.9
338			0.00	71.3	1.36	-	83.2	-0.036	4.25	0.432	21.1	36.9
339			0.00	71.3	1.30	-	83.2	-0.037	4.23	0.429	21.1	36.9
340	59.707	0.178	0.00	71.4	1.35	100	83.2	-0.037	4.18	0.429	21.1	36.9
341			0.00	71.3	1.35	-	83.0	-0.037	3.98	0.430	21.1	36.9
342			0.00	71.3	1.31	-	82.9	-0.036	3.97	0.432	21.1	36.9
343			0.00	71.3	1.35	-	82.8	-0.037	3.92	0.428	21.1	36.9
344			0.00	71.2	1.38	-	82.9	-0.037	3.90	0.427	21.1	36.9
345			0.00	71.3	1.32	-	82.9	-0.036	3.89	0.429	21.1	36.9
346			0.00	71.2	1.34	-	82.9	-0.036	3.87	0.426	21.2	36.9
347			0.00	71.3	1.39	-	82.9	-0.036	3.87	0.424	21.2	36.9
348			0.00	71.3	1.41	-	82.9	-0.036	3.86	0.421	21.2	36.9
349			0.00	71.3	1.34	-	82.8	-0.036	3.88	0.422	21.2	36.9
350	61.485	0.178	0.00	71.3	1.34	100	82.9	-0.036	3.87	0.418	21.2	36.9

Data from 12/20/22 testing - Reference Only



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
351			0.00	71.3	1.36	-	82.9	-0.036	3.87	0.417	21.2	36.9
352			0.00	71.3	1.40	-	82.9	-0.036	3.87	0.417	21.2	36.9
353			0.00	71.3	1.40	-	83.0	-0.036	3.99	0.413	21.2	36.9
354			0.00	71.3	1.36	-	82.9	-0.036	4.01	0.403	21.3	36.9
355			0.00	71.3	1.38	-	82.9	-0.036	4.02	0.395	21.3	36.9
356			0.00	71.3	1.41	-	82.9	-0.035	4.03	0.386	21.3	36.9
357			0.00	71.3	1.41	-	82.9	-0.036	4.05	0.385	21.3	36.9
358			0.00	71.3	1.38	-	82.9	-0.035	4.03	0.379	21.3	36.9
359			0.00	71.3	1.37	-	82.8	-0.036	4.09	0.387	21.3	36.9
360	63.236	0.175	0.00	71.3	1.41	99	82.8	-0.036	4.08	0.391	21.3	36.9
361			0.00	71.2	1.43	-	82.8	-0.035	4.09	0.388	21.3	36.9
362			0.00	71.2	1.46	-	82.8	-0.036	4.11	0.387	21.4	36.9
363			0.00	71.2	1.44	-	82.8	-0.035	4.11	0.385	21.4	36.9
364			0.00	71.3	1.44	-	82.8	-0.036	4.11	0.383	21.5	36.9
365			0.00	71.3	1.48	-	82.7	-0.035	4.13	0.382	21.5	36.9
366			0.00	71.4	1.51	-	82.7	-0.035	4.11	0.380	21.4	36.9
367			0.00	71.4	1.48	-	82.7	-0.035	4.09	0.377	21.5	36.9
368			0.00	71.4	1.45	-	82.6	-0.035	3.87	0.382	21.5	36.9
369			0.00	71.4	1.48	-	82.6	-0.035	3.85	0.387	21.5	36.9
370	65.011	0.177	0.00	71.4	1.52	100	82.7	-0.036	3.85	0.382	21.5	36.9
371			0.00	71.4	1.54	-	82.6	-0.035	3.83	0.378	21.5	36.9
372			0.00	71.4	1.54	-	82.6	-0.036	3.82	0.374	21.5	36.9
373			0.00	71.3	1.50	-	82.5	-0.035	3.83	0.372	21.5	36.7
374			0.00	71.4	1.48	-	82.5	-0.035	3.83	0.371	21.5	36.7
375			0.00	71.4	1.49	-	82.5	-0.035	3.81	0.368	21.5	36.9
376			0.00	71.4	1.55	-	82.5	-0.036	3.80	0.366	21.5	36.7
377			0.00	71.4	1.55	-	82.6	-0.035	3.81	0.369	21.6	36.7
378			0.00	71.5	1.55	-	82.6	-0.035	3.81	0.367	21.6	36.9
379			0.00	71.5	1.55	-	82.6	-0.035	3.78	0.364	21.6	36.9
380	66.763	0.175	0.00	71.5	1.56	99	82.6	-0.035	3.81	0.368	21.6	36.7
381			0.00	71.4	1.60	-	82.5	-0.035	3.79	0.365	21.6	36.7
382			0.00	71.4	1.62	-	82.5	-0.035	3.77	0.364	21.6	36.7
383			0.00	71.4	1.64	-	82.5	-0.035	3.78	0.363	21.6	36.7
384			0.00	71.4	1.61	-	82.5	-0.035	3.76	0.363	21.6	36.7
385			0.00	71.4	1.59	-	82.5	-0.035	3.76	0.362	21.6	36.7
386			0.00	71.4	1.66	-	82.5	-0.035	3.78	0.364	21.7	36.7
387			0.00	71.4	1.64	-	82.4	-0.035	3.76	0.360	21.7	36.7
388			0.00	71.4	1.62	-	82.5	-0.035	3.75	0.360	21.6	36.7
389			0.00	71.4	1.68	-	82.6	-0.035	3.81	0.367	21.7	36.7

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
390	68.534	0.177	0.00	71.5	1.70	99	82.6	-0.034	3.76	0.377	21.7	36.7
391			0.00	71.5	1.70	-	82.5	-0.035	3.74	0.384	21.7	36.7
392			0.00	71.6	1.69	-	82.4	-0.035	3.73	0.379	21.8	36.7
393			0.00	71.6	1.66	-	82.3	-0.035	3.70	0.374	21.8	36.7
394			0.00	71.6	1.65	-	82.4	-0.035	3.68	0.370	21.8	36.7
395			0.00	71.6	1.65	-	82.4	-0.035	3.67	0.367	21.8	36.7
396			0.00	71.7	1.66	-	82.4	-0.035	3.68	0.367	21.8	36.7
397			0.00	71.7	1.67	-	82.5	-0.035	3.66	0.366	21.8	36.7
398			0.00	71.7	1.70	-	82.5	-0.034	3.67	0.367	21.8	36.7
399			0.00	71.7	1.72	-	82.5	-0.034	3.66	0.365	21.8	36.7
400	70.286	0.175	0.00	71.7	1.74	99	82.5	-0.035	3.64	0.361	21.8	36.7
401			0.00	71.7	1.76	-	82.5	-0.034	3.62	0.358	21.8	36.7
402			0.00	71.7	1.76	-	82.5	-0.034	3.62	0.357	21.8	36.7
403			0.00	71.7	1.81	-	82.4	-0.034	3.61	0.356	21.8	36.7
404			0.00	71.7	1.82	-	82.5	-0.034	3.60	0.353	21.8	36.7
405			0.00	71.7	1.78	-	82.3	-0.034	3.63	0.355	21.8	36.7
406			0.00	71.6	1.77	-	82.3	-0.034	3.61	0.352	21.9	36.7
407			0.00	71.6	1.81	-	82.1	-0.034	3.59	0.349	21.9	36.7
408			0.00	71.7	1.78	-	82.2	-0.034	3.58	0.348	21.9	36.7
409			0.00	71.7	1.85	-	82.2	-0.034	3.58	0.348	21.9	36.7
410	72.053	0.177	0.00	71.7	1.80	100	82.1	-0.034	3.61	0.358	21.9	36.7
411			0.00	71.6	1.78	-	82.1	-0.034	3.61	0.360	21.9	36.7
412			0.00	71.5	1.81	-	82.0	-0.034	3.58	0.356	22.0	36.7
413			0.00	71.5	1.88	-	82.0	-0.034	3.57	0.356	22.0	36.7
414			0.00	71.5	1.87	-	82.7	-0.033	3.56	0.355	22.0	36.7
415			0.00	71.5	1.86	-	83.9	-0.034	3.55	0.352	22.0	36.7
416			0.00	71.5	1.90	-	84.9	-0.034	3.54	0.351	22.0	36.7
417			0.00	71.5	1.93	-	85.9	-0.034	3.51	0.350	22.0	36.7
418			0.00	71.5	1.91	-	86.8	-0.033	3.51	0.350	22.0	36.7
419			0.00	71.5	1.92	-	87.4	-0.033	3.57	0.357	22.0	36.7
420	73.826	0.177	0.00	71.5	1.94	100	88.3	-0.033	3.58	0.363	22.0	36.5
421			0.00	71.4	1.95	-	88.7	-0.033	3.12	0.354	22.0	36.5
422			0.00	71.4	1.97	-	88.3	-0.034	3.05	0.351	22.0	36.5
423			0.00	71.5	1.93	-	87.9	-0.033	3.04	0.346	22.1	36.5
424			0.00	71.4	1.95	-	87.4	-0.032	3.00	0.339	22.1	36.5
425			0.00	71.4	1.95	-	87.1	-0.033	2.99	0.339	22.1	36.5
426			0.00	71.4	1.94	-	86.6	-0.033	2.96	0.334	22.1	36.5
427			0.00	71.4	2.00	-	86.3	-0.032	2.95	0.333	22.1	36.5
428			0.00	71.4	1.93	-	86.0	-0.032	2.92	0.329	22.2	36.5

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
429			0.00	71.4	2.00	-	85.7	-0.032	2.92	0.330	22.2	36.5
430	75.591	0.176	0.00	71.5	1.97	99	85.4	-0.032	2.91	0.328	22.1	36.5
431			0.00	71.5	1.98	-	85.1	-0.032	2.89	0.324	22.2	36.5
432			0.00	71.4	1.95	-	85.0	-0.032	2.89	0.324	22.2	36.5
433			0.00	71.4	1.96	-	84.7	-0.032	2.88	0.324	22.2	36.5
434			0.00	71.4	2.01	-	84.5	-0.032	2.86	0.322	22.2	36.5
435			0.00	71.5	2.02	-	84.2	-0.032	2.86	0.321	22.2	36.5
436			0.00	71.4	2.01	-	84.0	-0.032	2.86	0.319	22.2	36.5
437			0.00	71.5	1.97	-	84.0	-0.031	2.85	0.320	22.3	36.5
438			0.00	71.4	2.01	-	83.8	-0.031	2.86	0.321	22.3	36.5
439			0.00	71.5	2.02	-	83.5	-0.031	2.84	0.319	22.3	36.5
440	77.346	0.176	0.00	71.5	2.00	98	83.4	-0.031	2.84	0.318	22.3	36.5
441			0.00	71.4	2.07	-	83.2	-0.032	2.85	0.318	22.3	36.5
442			0.00	71.3	2.10	-	83.0	-0.031	2.84	0.316	22.3	36.5
443			0.00	71.2	2.06	-	83.0	-0.031	2.86	0.318	22.4	36.5
444			0.00	71.1	2.12	-	82.9	-0.031	2.90	0.321	22.4	36.5
445			0.00	71.2	2.12	-	82.9	-0.031	2.89	0.321	22.4	36.5
446			0.00	71.2	2.04	-	82.7	-0.031	2.89	0.320	22.4	36.5
447			0.00	71.2	2.06	-	82.5	-0.030	2.88	0.318	22.4	36.5
448			0.00	71.2	2.10	-	82.4	-0.030	2.91	0.324	22.5	36.5
449			0.00	71.3	2.09	-	82.4	-0.031	2.90	0.321	22.5	36.5
450	79.127	0.178	0.00	70.9	2.09	99	82.4	-0.030	2.90	0.321	22.5	36.3
Avg/Tot	79.127	0.176	0.00	71.8	1.12	100	84.0	-0.052	6.45	0.541	20.27	41.951

Data from 12/20/22 testing - Reference Only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	72.3	0.23		86.6
1			0.00	72.3	0.23	-	86.8
2			0.00	72.4	0.25		87.4
3			0.00	72.5	0.23	-	87.2
4			0.00	72.5	0.23	-	84.6
5			0.00	72.6	0.23	-	84.3
6			0.00	72.7	0.21	-	84.5
7			0.00	72.7	0.23	-	84.6
8			0.00	72.8	0.22	-	84.5
9			0.00	72.8	0.22	-	84.3
10	1.726	0.173	0.00	72.8	0.22	106	84.2
11			0.00	72.9	0.21	-	84.1
12			0.00	72.9	0.22	-	84.1
13			0.00	73.0	0.20	-	84.3
14			0.00	73.0	0.23	-	84.1
15			0.00	73.0	0.23	-	83.8
16			0.00	73.0	0.22	-	83.5
17			0.00	73.0	0.22	-	82.9
18			0.00	73.0	0.22	-	82.6
19			0.00	73.1	0.22	-	82.1
20	3.419	0.169	0.00	73.1	0.21	102	82.0
21			0.00	73.1	0.21	-	81.7
22			0.00	73.1	0.22	-	82.2
23			0.00	73.1	0.20	-	82.9
24			0.00	73.1	0.21	-	83.4
25			0.00	73.2	0.22	-	83.9
26			0.00	73.2	0.22	-	84.2
27			0.00	73.2	0.21	-	84.5
28			0.00	73.2	0.20	-	85.1
29			0.00	73.2	0.20	-	85.4
30	5.118	0.170	0.00	73.2	0.21	102	85.7
31			0.00	73.1	0.23	-	85.9

Data from 12/20/2022 testing - Reference only

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	73.1	0.21	-	86.1
33			0.00	73.0	0.21	-	86.2
34			0.00	73.0	0.21	-	86.0
35			0.00	73.0	0.21	-	85.8
36			0.00	73.0	0.20	-	85.5
37			0.00	73.0	0.20	-	85.3
38			0.00	73.1	0.20	-	85.2
39			0.00	73.1	0.21	-	85.1
40	6.821	0.170	0.00	73.1	0.21	101	85.0
41			0.00	73.1	0.22	-	85.0
42			0.00	73.1	0.22	-	85.0
43			0.00	73.1	0.23	-	84.9
44			0.00	73.1	0.23	-	84.9
45			0.00	73.0	0.22	-	84.9
46			0.00	73.1	0.24	-	84.8
47			0.00	73.1	0.23	-	84.7
48			0.00	73.1	0.23	-	84.6
49			0.00	73.0	0.23	-	84.6
50	8.551	0.173	0.00	73.1	0.23	103	84.4
51			0.00	73.0	0.24	-	84.4
52			0.00	72.9	0.24	-	84.3
53			0.00	72.9	0.23	-	84.2
54			0.00	72.9	0.25	-	84.3
55			0.00	72.9	0.25	-	84.5
56			0.00	73.0	0.25	-	84.7
57			0.00	73.1	0.26	-	85.0
58			0.00	73.1	0.28	-	84.9
59			0.00	73.1	0.28	-	84.9
60	10.284	0.173	0.00	73.1	0.28	104	85.2
Avg/Tot	10.284	0.171	0.00	73.0	0.22	103	84.6

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	610.1	459.3	546.5	426.0	436.7	495.7	0
1	573.0	462.6	544.1	425.4	438.2	488.7	0
2	546.9	465.6	539.4	423.4	436.3	482.3	0
3	550.6	467.1	532.6	421.2	434.0	481.1	0
4	572.8	466.4	522.8	419.0	431.8	482.6	0
5	597.7	465.6	511.7	417.5	430.8	484.7	0
6	621.5	464.5	501.2	415.8	428.8	486.4	0
7	639.2	462.5	491.5	413.3	425.8	486.5	0
8	649.9	460.0	482.4	411.7	423.3	485.5	0
9	658.2	457.6	474.1	410.0	420.1	484.0	0
10	665.4	455.2	466.8	408.0	417.4	482.6	0
11	670.5	452.2	460.2	405.6	415.0	480.7	0
12	673.9	449.0	454.4	403.9	412.5	478.7	0
13	673.9	446.2	449.7	401.8	409.5	476.2	0
14	679.2	442.7	444.6	400.3	406.4	474.6	0
15	683.9	435.3	439.9	398.2	403.5	472.1	0
16	690.2	428.0	436.0	397.0	400.4	470.3	0
17	688.9	421.4	432.4	394.7	397.8	467.0	0
18	683.6	414.9	428.8	393.5	395.3	463.2	0
19	677.4	410.2	425.3	391.8	393.0	459.5	0
20	675.1	405.9	421.7	389.6	389.5	456.4	0
21	674.3	401.6	418.0	387.6	386.0	453.5	0
22	674.1	397.4	414.4	385.6	382.7	450.9	0
23	674.3	393.1	410.9	383.8	379.4	448.3	0
24	674.0	388.9	407.7	381.3	376.0	445.6	0
25	674.3	384.9	404.7	379.2	372.7	443.2	0
26	675.2	380.8	401.6	377.0	369.6	440.8	0
27	675.7	376.9	398.6	375.0	366.7	438.6	0
28	676.8	372.9	395.6	373.4	363.7	436.5	0
29	678.2	369.0	392.8	371.7	360.9	434.5	0
30	680.3	365.2	390.1	370.1	358.3	432.8	0
31	682.8	361.4	387.6	368.6	355.9	431.2	0
32	685.0	357.7	385.1	367.5	353.3	429.7	0
33	686.7	354.2	382.8	366.2	351.0	428.2	0
34	688.4	351.0	380.7	365.1	349.0	426.8	0
35	690.3	347.9	378.8	363.9	347.0	425.6	0
36	692.3	344.8	376.9	362.8	345.1	424.4	0
37	694.2	341.8	375.2	362.1	343.2	423.3	0
38	697.3	339.0	373.7	361.1	341.4	422.5	0
39	701.2	336.1	372.4	360.9	339.6	422.1	0
40	705.3	333.3	371.4	360.3	338.1	421.7	0
41	708.9	330.4	370.4	360.1	336.6	421.3	0
42	711.7	327.7	369.5	359.8	335.4	420.8	0
43	713.9	325.2	368.8	359.6	334.3	420.4	0
44	716.0	322.6	368.3	359.6	333.3	420.0	0
45	718.4	320.2	367.7	359.4	332.4	419.6	0
46	720.8	317.7	367.2	359.6	331.6	419.4	0
47	722.9	315.3	366.8	359.4	330.8	419.1	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	725.4	313.1	366.6	359.0	330.2	418.8	0
49	727.9	310.9	366.4	358.7	329.5	418.7	0
50	729.8	308.7	366.2	358.4	329.0	418.5	0
51	731.7	306.6	366.2	358.3	328.6	418.3	0
52	732.5	304.6	366.1	357.9	328.2	417.9	0
53	734.1	302.8	366.1	358.0	327.8	417.8	0
54	735.8	301.1	366.2	357.7	327.4	417.6	0
55	736.8	299.4	366.4	357.9	327.1	417.5	0
56	737.7	297.6	366.7	357.8	327.0	417.4	0
57	738.5	295.9	367.0	357.9	326.9	417.2	0
58	738.7	294.3	367.3	358.0	326.8	417.0	0
59	739.5	292.7	367.7	358.1	326.8	417.0	0
60	739.7	291.4	368.1	358.2	326.9	416.8	0
61	740.5	289.9	368.5	358.1	327.1	416.8	0
62	741.7	288.3	369.0	358.3	327.1	416.9	0
63	743.5	286.9	369.5	358.1	327.1	417.0	0
64	745.7	285.4	369.9	358.1	327.1	417.2	0
65	746.8	284.2	370.2	358.6	327.1	417.4	0
66	748.8	282.9	370.6	358.5	327.2	417.6	0
67	751.7	281.9	370.9	358.8	327.2	418.1	0
68	754.0	280.9	371.4	359.1	327.1	418.5	0
69	756.1	279.7	372.0	359.4	327.2	418.9	0
70	758.3	278.7	372.9	359.8	327.2	419.4	0
71	760.3	277.7	373.7	359.4	327.3	419.7	0
72	762.0	276.7	374.7	360.0	327.2	420.1	0
73	763.0	275.8	375.7	360.4	327.4	420.5	0
74	762.6	274.9	376.8	360.9	327.5	420.5	0
75	761.1	274.3	377.7	361.4	327.7	420.4	0
76	758.2	273.7	378.7	361.9	327.9	420.1	0
77	753.9	273.2	379.8	362.2	328.1	419.4	0
78	749.9	272.7	380.8	362.9	328.3	418.9	0
79	746.0	272.2	381.8	363.6	328.5	418.4	0
80	743.1	271.7	382.8	364.3	328.8	418.2	0
81	740.9	271.2	384.0	365.0	329.2	418.1	0
82	738.4	270.6	385.0	365.9	329.5	417.9	0
83	736.4	270.1	386.2	366.5	329.8	417.8	0
84	735.0	269.6	387.4	367.3	330.1	417.9	0
85	734.1	269.0	388.5	368.1	330.5	418.0	0
86	732.8	268.3	389.6	368.7	330.9	418.0	0
87	732.3	267.4	390.7	369.2	331.3	418.2	0
88	731.5	266.7	391.9	370.1	331.8	418.4	0
89	731.8	266.1	393.0	370.9	332.3	418.9	0
90	732.9	265.7	394.2	370.9	332.9	419.3	0
91	734.1	265.2	395.4	371.4	333.5	419.9	0
92	736.1	264.8	396.6	371.9	333.9	420.6	0
93	739.2	264.4	397.7	372.8	334.6	421.8	0
94	741.6	263.8	398.9	373.7	335.6	422.7	0
95	743.4	263.4	400.1	374.4	336.5	423.5	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
96	744.5	263.1	401.3	375.1	337.3	424.3	0
97	745.0	262.9	402.4	375.7	338.1	424.8	0
98	744.3	262.7	403.5	376.4	338.9	425.2	0
99	743.4	262.6	404.7	376.9	339.7	425.4	0
100	743.2	262.5	405.8	377.4	340.5	425.9	0
101	741.4	262.4	406.9	377.8	341.3	426.0	0
102	736.2	262.5	407.9	378.0	341.8	425.3	0
103	728.5	262.7	408.7	378.2	342.5	424.1	0
104	719.8	262.8	409.3	378.4	343.5	422.8	0
105	710.9	263.0	409.7	378.5	344.3	421.3	0
106	701.8	263.2	409.8	378.3	345.1	419.7	0
107	693.4	263.3	409.7	378.0	345.8	418.1	0
108	686.4	263.6	409.4	377.7	346.5	416.7	0
109	680.3	263.6	409.0	377.1	347.0	415.4	0
110	674.2	263.7	408.3	376.5	347.5	414.0	0
111	665.7	263.8	407.3	375.5	348.0	412.1	0
112	654.1	263.9	406.1	374.7	348.4	409.4	0
113	638.2	264.0	404.5	373.7	348.6	405.8	0
114	621.2	264.1	402.5	372.5	348.7	401.8	0
115	604.7	264.3	400.2	371.2	349.0	397.9	0
116	589.0	264.2	397.4	369.9	348.9	393.9	0
117	574.4	264.3	394.5	368.1	348.4	390.0	0
118	561.6	264.5	391.7	367.1	348.1	386.6	0
119	549.8	264.8	388.9	365.8	347.9	383.4	0
120	538.3	265.0	386.2	364.3	347.6	380.3	0
121	527.8	265.3	383.6	362.6	347.2	377.3	0
122	518.8	265.5	381.2	361.0	346.7	374.6	0
123	510.5	265.7	379.0	359.4	346.1	372.1	0
124	503.7	265.9	376.9	357.8	345.7	370.0	0
125	497.8	266.2	375.3	356.5	345.4	368.2	0
126	492.3	266.5	373.8	355.0	344.9	366.5	0
127	487.3	266.8	372.6	353.5	344.3	364.9	0
128	482.9	267.1	371.7	352.0	343.8	363.5	0
129	478.6	267.4	370.8	350.4	343.2	362.1	0
130	473.9	267.7	370.0	348.9	342.6	360.6	0
131	468.9	267.8	369.3	347.2	341.9	359.0	0
132	464.1	268.1	368.6	345.6	341.2	357.5	0
133	459.1	268.2	367.9	344.2	340.4	356.0	0
134	454.5	268.2	367.2	342.8	339.6	354.5	0
135	449.8	268.3	366.5	341.3	338.8	353.0	0
136	445.8	268.6	365.8	339.9	338.0	351.6	0
137	441.9	268.5	365.2	338.6	337.2	350.3	0
138	437.9	268.6	364.5	337.2	336.4	348.9	0
139	434.1	268.7	363.9	335.8	335.5	347.6	0
140	430.4	268.8	363.2	334.6	334.7	346.3	0
141	426.6	269.0	362.5	332.7	333.3	344.8	0
142	422.8	268.7	361.6	330.3	331.6	343.0	0
143	419.4	268.2	360.5	328.4	329.9	341.3	0

Data from 12/20/22 testing - Reference only



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
144	415.8	267.7	359.3	326.6	328.4	339.5	0
145	412.3	267.1	358.0	324.8	326.9	337.8	0
146	408.7	266.6	356.6	323.1	325.6	336.1	0
147	405.3	266.1	355.2	321.6	324.2	334.5	0
148	402.2	265.8	353.7	320.5	323.3	333.1	0
149	399.4	265.6	352.4	319.2	322.4	331.8	0
150	396.8	265.4	351.2	318.0	321.7	330.6	0
151	394.3	265.3	350.1	316.9	320.9	329.5	0
152	392.0	265.2	349.1	315.6	320.1	328.4	0
153	389.8	265.1	348.1	314.7	319.4	327.4	0
154	387.8	265.0	347.1	313.8	318.5	326.4	0
155	385.5	264.8	346.1	312.7	317.4	325.3	0
156	383.1	264.5	345.1	311.7	316.4	324.2	0
157	381.1	264.1	344.1	310.8	315.5	323.1	0
158	379.1	263.8	343.2	310.0	314.6	322.1	0
159	377.1	263.5	342.3	309.0	313.8	321.1	0
160	375.4	263.4	341.4	308.1	313.0	320.2	0
161	373.5	263.1	340.5	307.2	312.0	319.3	0
162	371.5	262.9	339.7	306.4	311.1	318.3	0
163	369.5	262.7	338.9	305.6	310.2	317.4	0
164	367.5	262.4	338.2	304.7	309.6	316.5	0
165	365.5	262.0	337.4	303.9	308.9	315.5	0
166	363.7	261.9	336.7	303.2	308.1	314.7	0
167	361.8	261.7	336.0	302.6	307.3	313.9	0
168	360.0	261.6	335.3	301.9	306.6	313.1	0
169	358.2	261.4	334.6	301.1	305.9	312.3	0
170	356.5	261.1	334.0	300.5	305.3	311.5	0
171	354.7	260.9	333.3	299.9	304.6	310.7	0
172	353.0	260.6	332.8	299.2	304.1	309.9	0
173	351.5	260.2	332.3	298.4	303.6	309.2	0
174	349.9	260.0	331.7	297.7	303.0	308.5	0
175	348.6	259.9	331.2	297.1	302.5	307.8	0
176	347.3	259.7	330.7	296.7	302.4	307.4	0
177	346.3	259.6	330.2	296.3	302.3	307.0	0
178	345.4	259.5	329.7	295.9	302.0	306.5	0
179	344.3	259.5	329.2	295.5	301.8	306.1	0
180	343.1	259.5	328.8	295.1	301.6	305.6	0
181	342.1	259.5	328.2	294.7	301.3	305.2	0
182	341.1	259.4	327.7	294.2	300.9	304.7	0
183	340.1	259.4	327.3	293.7	300.6	304.2	0
184	339.1	259.3	326.8	293.3	300.2	303.8	0
185	338.3	259.2	326.4	292.8	299.8	303.3	0
186	337.4	259.2	325.9	292.4	299.4	302.9	0
187	336.7	259.1	325.5	291.8	299.0	302.4	0
188	335.7	259.1	325.1	291.4	298.7	302.0	0
189	334.8	259.0	324.7	291.0	298.3	301.6	0
190	334.0	259.1	324.3	290.5	297.8	301.1	0
191	333.1	259.0	323.9	290.0	297.4	300.7	0

Data from 12/20/22 test - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
192	332.4	259.0	323.6	289.6	297.1	300.3	0
193	331.8	258.9	323.3	289.1	296.7	300.0	0
194	331.0	259.0	322.9	288.7	296.3	299.6	0
195	330.4	259.0	322.7	288.2	296.0	299.2	0
196	329.7	258.9	322.3	287.8	295.6	298.9	0
197	329.1	258.9	321.9	287.5	295.3	298.5	0
198	328.5	258.8	321.6	286.9	295.0	298.1	0
199	327.7	258.7	321.3	286.6	294.6	297.8	0
200	327.1	258.6	321.0	286.1	294.2	297.4	0
201	326.5	258.6	320.8	285.8	293.9	297.1	0
202	325.9	258.6	320.4	285.4	293.5	296.8	0
203	325.3	258.5	320.2	285.0	293.2	296.4	0
204	324.8	258.6	319.9	284.6	292.9	296.2	0
205	324.2	258.5	319.6	284.2	292.5	295.8	0
206	323.7	258.5	319.2	283.8	292.2	295.5	0
207	322.9	258.3	318.8	283.4	291.8	295.1	0
208	322.4	258.3	318.4	283.0	291.5	294.7	0
209	321.8	258.2	318.1	282.7	291.2	294.4	0
210	321.2	258.2	317.6	282.3	290.9	294.0	0
211	320.6	258.1	317.2	281.8	290.4	293.6	0
212	319.9	258.0	316.9	281.6	290.0	293.3	0
213	319.3	258.0	316.5	281.1	289.7	292.9	0
214	318.6	257.9	316.1	280.8	289.4	292.6	0
215	318.0	257.7	315.7	280.5	288.9	292.2	0
216	317.3	257.7	315.4	280.1	288.6	291.8	0
217	316.7	257.7	315.1	279.7	288.2	291.5	0
218	316.1	257.5	314.8	279.3	287.8	291.1	0
219	315.5	257.4	314.5	278.9	287.4	290.8	0
220	314.8	257.3	314.2	278.6	287.1	290.4	0
221	314.2	257.2	314.0	278.3	286.7	290.1	0
222	313.7	257.1	313.8	278.0	286.3	289.8	0
223	313.0	257.0	313.6	277.5	286.0	289.4	0
224	312.4	256.9	313.5	277.3	285.5	289.1	0
225	311.7	256.9	313.3	276.9	285.2	288.8	0
226	311.1	256.8	313.2	276.5	284.9	288.5	0
227	310.7	256.7	313.0	276.2	284.7	288.3	0
228	310.1	256.6	312.6	275.9	284.3	287.9	0
229	309.8	256.5	311.9	275.5	284.0	287.6	0
230	309.3	256.5	311.3	275.2	283.7	287.2	0
231	308.9	256.4	310.5	274.9	283.3	286.8	0
232	308.5	256.3	309.8	274.6	283.1	286.5	0
233	308.1	256.2	309.0	274.2	282.8	286.1	0
234	307.6	256.1	308.3	273.9	282.5	285.7	0
235	307.1	256.0	307.5	273.5	282.2	285.3	0
236	306.6	255.9	306.8	273.2	281.9	284.9	0
237	306.2	255.9	306.2	272.8	281.6	284.5	0
238	305.8	255.7	305.6	272.5	281.4	284.2	0
239	305.4	255.7	305.0	272.2	281.1	283.9	0

Data from 12/20/22 test - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
240	304.9	255.6	304.4	271.9	280.9	283.5	0
241	304.5	255.6	303.9	271.6	280.6	283.2	0
242	304.1	255.5	303.4	271.2	280.2	282.9	0
243	303.7	255.6	303.0	270.8	280.0	282.6	0
244	303.3	255.4	302.5	270.5	279.7	282.3	0
245	302.7	255.4	302.2	270.2	279.4	282.0	0
246	302.3	255.3	301.8	269.9	279.1	281.7	0
247	302.0	255.2	301.5	269.5	278.9	281.4	0
248	301.5	255.2	301.1	269.0	278.5	281.1	0
249	301.1	255.1	300.8	268.7	278.2	280.8	0
250	300.8	255.1	300.5	268.4	278.0	280.6	0
251	300.3	255.0	300.2	268.1	277.6	280.3	0
252	300.0	254.9	300.0	267.9	277.3	280.0	0
253	299.6	254.8	299.7	267.6	277.1	279.7	0
254	299.3	254.7	299.4	267.4	276.8	279.5	0
255	298.9	254.7	299.2	267.1	276.6	279.3	0
256	298.4	254.5	299.0	266.9	276.2	279.0	0
257	297.9	254.5	298.8	266.6	276.0	278.7	0
258	297.6	254.4	298.7	266.3	275.7	278.5	0
259	297.3	254.4	298.6	266.1	275.5	278.4	0
260	296.8	254.3	298.5	265.9	275.2	278.1	0
261	296.5	254.2	298.3	265.6	274.9	277.9	0
262	296.3	254.1	298.3	265.5	274.7	277.8	0
263	296.0	254.1	298.2	265.2	274.4	277.6	0
264	295.8	254.0	298.1	265.0	274.2	277.4	0
265	295.4	254.0	298.1	264.8	273.9	277.2	0
266	295.1	254.0	298.0	264.6	273.7	277.1	0
267	294.7	253.8	298.0	264.3	273.4	276.9	0
268	294.4	253.8	298.1	264.1	273.1	276.7	0
269	294.2	253.7	298.1	263.9	272.9	276.5	0
270	294.0	253.7	298.2	263.7	272.6	276.4	0
271	293.8	253.6	298.3	263.4	272.5	276.3	0
272	293.5	253.5	298.4	263.2	272.3	276.2	0
273	293.3	253.5	298.6	263.0	272.1	276.1	0
274	293.1	253.4	298.7	262.7	272.0	276.0	0
275	292.8	253.4	298.8	262.7	271.8	275.9	0
276	292.7	253.4	299.0	262.5	271.6	275.8	0
277	292.5	253.4	299.2	262.3	271.4	275.7	0
278	292.3	253.4	299.4	262.1	271.2	275.7	0
279	292.0	253.4	299.6	261.9	271.1	275.6	0
280	291.7	253.4	299.8	261.7	270.9	275.5	0
281	291.4	253.4	299.9	261.6	270.8	275.4	0
282	291.2	253.4	300.1	261.4	270.7	275.3	0
283	291.1	253.5	300.1	261.2	270.6	275.3	0
284	290.8	253.5	300.2	261.0	270.4	275.2	0
285	290.6	253.5	300.3	260.8	270.0	275.1	0
286	290.4	253.5	300.3	260.6	270.0	274.9	0
287	290.3	253.5	300.4	260.4	269.7	274.9	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
288	290.1	253.4	300.4	260.2	269.6	274.7	0
289	289.8	253.4	300.5	260.0	269.5	274.6	0
290	289.6	253.4	300.5	259.9	269.4	274.6	0
291	289.3	253.4	300.5	259.7	269.2	274.4	0
292	289.3	253.6	300.5	259.5	269.1	274.4	0
293	289.1	253.6	300.6	259.3	268.9	274.3	0
294	288.9	253.6	300.6	259.2	268.8	274.2	0
295	288.8	253.7	300.6	259.0	268.6	274.1	0
296	288.7	253.7	300.6	258.9	268.6	274.1	0
297	288.6	253.7	300.6	258.9	268.5	274.1	0
298	288.6	253.8	300.5	258.7	268.4	274.0	0
299	288.5	253.9	300.5	258.5	268.3	273.9	0
300	288.4	253.9	300.5	258.3	268.3	273.9	0
301	288.2	253.9	300.4	258.1	268.2	273.8	0
302	288.0	253.9	300.5	258.0	268.2	273.7	0
303	287.8	253.9	300.5	257.8	268.2	273.6	0
304	287.7	253.9	300.5	257.7	268.0	273.6	0
305	287.5	253.9	300.5	257.5	267.9	273.5	0
306	287.5	253.9	300.5	257.4	268.0	273.5	0
307	287.6	253.8	300.5	257.3	267.8	273.4	0
308	287.4	253.9	300.5	257.2	267.8	273.4	0
309	287.5	253.9	300.5	257.0	267.7	273.3	0
310	287.6	253.9	300.5	256.9	267.7	273.3	0
311	287.6	253.9	300.5	256.9	267.6	273.3	0
312	287.5	253.8	300.6	256.8	267.5	273.3	0
313	287.5	253.9	300.6	256.7	267.4	273.2	0
314	287.6	253.9	300.6	256.6	267.4	273.2	0
315	287.5	253.8	300.5	256.5	267.3	273.1	0
316	287.3	253.8	300.4	256.3	267.2	273.0	0
317	287.2	253.8	300.3	256.1	267.0	272.9	0
318	287.1	253.7	300.3	256.0	266.8	272.8	0
319	286.9	253.7	300.2	255.9	266.6	272.7	0
320	286.8	253.6	300.1	255.9	266.4	272.6	0
321	286.5	253.5	300.1	255.7	266.2	272.4	0
322	286.5	253.4	300.1	255.6	266.0	272.3	0
323	286.5	253.3	300.2	255.4	265.6	272.2	0
324	286.3	253.1	300.3	255.3	265.3	272.1	0
325	286.1	253.0	300.3	255.2	265.0	271.9	0
326	285.9	252.9	300.5	255.0	264.7	271.8	0
327	285.5	252.7	300.6	254.9	264.4	271.6	0
328	285.3	252.6	300.8	254.8	264.1	271.5	0
329	284.9	252.5	300.9	254.8	263.7	271.4	0
330	284.7	252.4	301.1	254.6	263.3	271.2	0
331	284.4	252.2	301.2	254.4	262.9	271.0	0
332	284.1	252.1	301.3	254.4	262.6	270.9	0
333	283.9	252.0	301.4	254.2	262.3	270.8	0
334	283.6	251.9	301.5	254.1	261.9	270.6	0
335	283.3	251.7	301.7	253.9	261.5	270.4	0

Data from 12/20/22 testings - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
336	283.0	251.5	301.7	253.9	261.1	270.2	0
337	282.8	251.3	301.7	253.7	260.7	270.1	0
338	282.4	251.1	301.7	253.5	260.4	269.8	0
339	282.1	251.0	301.6	253.4	260.1	269.6	0
340	281.8	250.9	301.5	253.3	259.7	269.4	0
341	281.6	250.8	301.4	253.2	259.3	269.3	0
342	281.3	250.7	301.2	253.1	259.0	269.0	0
343	280.9	250.5	301.0	252.9	258.6	268.8	0
344	280.6	250.4	300.7	252.8	258.3	268.6	0
345	280.2	250.2	300.4	252.6	258.0	268.3	0
346	279.8	250.1	300.0	252.4	257.5	268.0	0
347	279.3	250.0	299.7	252.1	257.2	267.7	0
348	278.9	249.8	299.2	251.9	256.7	267.3	0
349	278.2	249.7	298.9	251.7	256.4	267.0	0
350	277.7	249.5	298.5	251.2	256.1	266.6	0
351	277.3	249.2	298.1	250.7	255.7	266.2	0
352	276.8	249.0	297.7	250.3	255.3	265.8	0
353	276.4	248.8	297.4	249.8	254.9	265.5	0
354	275.9	248.5	297.1	249.4	254.5	265.1	0
355	275.5	248.4	296.7	248.8	254.1	264.7	0
356	275.1	248.1	296.5	248.4	253.7	264.4	0
357	274.7	247.9	296.3	247.9	253.2	264.0	0
358	274.4	247.7	296.2	247.4	252.8	263.7	0
359	274.2	247.4	296.0	246.8	252.4	263.4	0
360	273.9	247.3	296.0	246.3	252.0	263.1	0
361	273.6	247.1	295.9	245.9	251.6	262.8	0
362	273.3	246.9	296.0	245.3	251.3	262.6	0
363	273.2	246.7	296.1	244.8	251.0	262.4	0
364	272.9	246.5	296.2	244.3	250.6	262.1	0
365	272.8	246.4	296.4	243.8	250.3	261.9	0
366	272.7	246.2	296.6	243.3	250.0	261.8	0
367	272.5	246.0	296.8	242.8	249.8	261.6	0
368	272.3	245.8	297.1	242.5	249.5	261.4	0
369	271.9	245.7	297.3	242.0	249.3	261.2	0
370	271.6	245.5	297.3	241.5	249.0	261.0	0
371	271.3	245.3	297.0	241.1	248.8	260.7	0
372	271.0	245.2	296.5	240.7	248.5	260.4	0
373	270.7	245.0	295.9	240.3	248.3	260.0	0
374	270.4	244.9	295.2	240.0	248.0	259.7	0
375	270.0	244.8	294.5	239.5	247.7	259.3	0
376	269.6	244.7	293.9	239.1	247.4	258.9	0
377	269.3	244.4	293.2	238.7	247.0	258.5	0
378	268.9	244.3	292.6	238.3	246.7	258.2	0
379	268.7	244.1	292.1	237.9	246.4	257.8	0
380	268.4	244.0	291.6	237.5	246.0	257.5	0
381	268.1	243.9	291.1	237.2	245.6	257.2	0
382	267.8	243.7	290.6	236.8	245.3	256.8	0
383	267.6	243.5	290.1	236.4	244.9	256.5	0

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
384	267.3	243.3	289.7	236.0	244.5	256.2	0
385	267.0	243.1	289.3	235.7	244.0	255.8	0
386	266.7	243.0	289.0	235.4	243.7	255.6	0
387	266.4	242.8	288.7	235.1	243.2	255.3	0
388	266.0	242.6	288.4	234.7	242.9	254.9	0
389	265.8	242.5	288.1	234.2	242.4	254.6	0
390	265.6	242.3	287.8	233.9	242.1	254.3	0
391	265.3	242.1	287.5	233.5	241.6	254.0	0
392	265.1	242.0	287.1	233.3	241.2	253.8	0
393	264.9	241.9	286.7	232.9	240.8	253.4	0
394	264.5	241.8	286.2	232.6	240.4	253.1	0
395	264.4	241.6	285.9	232.3	239.9	252.8	0
396	264.1	241.4	285.5	232.0	239.5	252.5	0
397	263.7	241.3	285.0	231.6	239.1	252.1	0
398	263.4	241.1	284.7	231.3	238.7	251.9	0
399	263.1	241.0	284.3	231.0	238.4	251.6	0
400	262.8	240.8	284.0	230.7	238.0	251.3	0
401	262.4	240.7	283.7	230.4	237.7	251.0	0
402	262.1	240.5	283.4	230.1	237.3	250.7	0
403	262.0	240.3	283.2	229.7	237.0	250.4	0
404	261.4	240.2	283.0	229.4	236.6	250.1	0
405	261.1	239.9	282.9	229.0	236.2	249.8	0
406	260.8	239.8	282.8	228.7	235.9	249.6	0
407	260.4	239.6	282.6	228.4	235.5	249.3	0
408	260.1	239.4	282.5	228.1	235.1	249.0	0
409	259.8	239.2	282.4	227.7	234.7	248.8	0
410	259.5	239.0	282.3	227.3	234.5	248.5	0
411	259.1	238.9	282.2	227.0	234.1	248.3	0
412	258.8	238.7	282.1	226.6	233.7	248.0	0
413	258.4	238.6	282.0	226.3	233.4	247.7	0
414	258.1	238.4	281.8	226.0	233.0	247.5	0
415	257.8	238.2	281.8	225.7	232.7	247.2	0
416	257.5	238.1	281.7	225.4	232.4	247.0	0
417	257.2	237.9	281.6	225.1	232.0	246.8	0
418	256.7	237.8	281.5	224.8	231.6	246.5	0
419	256.6	237.7	281.4	224.5	231.3	246.3	0
420	256.2	237.6	281.5	224.1	230.9	246.0	0
421	255.7	237.3	281.4	223.7	230.7	245.8	0
422	255.2	237.2	281.0	223.5	230.4	245.4	0
423	254.7	237.1	280.3	223.2	230.0	245.1	0
424	254.1	236.9	279.5	222.8	229.8	244.6	0
425	253.7	236.7	278.6	222.5	229.4	244.2	0
426	253.0	236.6	277.8	222.0	229.1	243.7	0
427	252.4	236.3	276.9	221.6	228.7	243.2	0
428	251.9	236.1	275.9	221.2	228.2	242.7	0
429	251.2	235.9	275.0	220.8	227.8	242.1	0
430	250.5	235.7	274.1	220.3	227.4	241.6	0
431	249.9	235.4	273.2	219.8	227.0	241.1	0

Data from 12/20/22 test - Reference only

## WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
432	249.2	235.2	272.3	219.3	226.5	240.5	0
433	248.5	234.9	271.4	218.8	226.1	240.0	0
434	247.9	234.6	270.5	218.4	225.6	239.4	0
435	247.3	234.3	269.7	217.9	225.1	238.9	0
436	246.5	233.9	268.9	217.3	224.6	238.2	0
437	245.9	233.6	268.1	216.7	224.1	237.7	0
438	245.3	233.3	267.4	216.2	223.6	237.2	0
439	244.6	233.0	266.7	215.7	223.2	236.6	0
440	244.1	232.6	265.9	215.1	222.7	236.1	0
441	243.4	232.2	265.2	214.5	222.1	235.5	0
442	242.8	231.8	264.6	214.0	221.6	235.0	0
443	242.2	231.4	264.0	213.4	221.2	234.4	0
444	241.5	231.0	263.3	212.9	220.6	233.9	0
445	240.9	230.6	262.7	212.3	220.2	233.3	0
446	240.3	230.3	262.2	211.8	219.8	232.9	0
447	239.8	229.9	261.6	211.2	219.3	232.4	0
448	239.2	229.5	261.0	210.7	218.9	231.9	0
449	238.9	229.2	260.5	210.2	218.4	231.4	0
450	228.2	221.6	253.9	199.8	209.6	222.6	0
Average	413.4	271.1	333.0	295.4	294.6	321	0

Data from 12/20/2022 testing - Reference only

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

		Sample ID	Tare, mg		Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0125	186.5		190.1	3.6
	<b>B</b>	H0126	187.1		190.6	3.5
	<b>C - 1st Hour</b>	H0127	186.7		188.8	2.1
	<b>Amb</b>	H0149	90.6		90.7	0.1
<b>Probes</b>	<b>A</b>	14A	116632.9		116632.9	0.0
	<b>B</b>	14B	116618.6		116618.7	0.1
	<b>C - 1st Hour</b>	14C	116530.3		116530.2	0.0*
<b>O-rings</b>	<b>A</b>	14A	3367.1		3367.2	0.1
	<b>B</b>	14B	3342.1		3342.0	0.0*
	<b>C - 1st Hour</b>	14C	3446.7		3446.7	0.0

\*Negative value corrected to zero

**Placed in Dessicator on:** 12/26/2022

<b>Filters</b>	<b>A</b>	190.0	12/20 7:52	190.3	12/31 12:00	190.1	1/3 9:42	
	<b>B</b>	190.4	12/20 7:52	190.6	12/31 12:00	190.6	1/3 9:42	
	<b>C - 1st Hour</b>	190.1	12/20 7:52	188.9	12/31 12:00	188.8	1/3 9:43	
	<b>Amb</b>	90.6	12/20 7:52	90.6	12/31 12:12	90.7	1/3 9:43	
<b>Probes</b>	<b>A</b>			116633.1	12/31 12:09	116632.8	1/3 9:43	116632.9
	<b>B</b>			116619.0	12/31 12:09	116618.6	1/3 9:43	116618.7
	<b>C - 1st Hour</b>			116530.4	12/31 12:10	116530.2	1/3 9:43	
<b>O-Rings</b>	<b>A</b>			3367.1	12/31 12:00	3367.2	1/3 9:43	
	<b>B</b>			3342.0	12/31 12:00	3342.0	1/3 9:43	
	<b>C - 1st Hour</b>			3446.7	12/31 12:00	3446.7	1/3 9:43	

<b>Train A Aggregate, mg:</b>	<b>3.7</b>
<b>Train B Aggregate, mg:</b>	<b>3.6</b>
<b>Train C Aggregate, mg:</b>	<b>2.1</b>
<b>Ambient Aggregate, mg:</b>	<b>0.1</b>



**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 5 Data Summary**

Client: SBI  
Model: J.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/21/2022

*Data from 12/2022 testing - reference only*

  
\_\_\_\_\_  
Technician Signature

7/12/2023  
\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBIModel: 1.7RRun #: 5Job #: 22-835Tracking #: 135Technician: AKDate: 12/21/2022

<b>Burn Rate (kg/hr):</b>	<b>3.93</b>
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	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	23.219	17.657	17.695	12.643
Average Gas Velocity in Dilution Tunnel (ft/sec)	23.20			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	26532.6			
Average Gas Meter Temperature (°F)	77.5	71.7	70.8	69.2
Total Sample Volume (dscf)	22.963	17.880	17.878	12.561
Average Tunnel Temperature (°F)	106.5			
Total Time of Test (min)	105			
Total Particulate Catch (mg)	0.0	2.2	2.3	1.8
Particulate Concentration, dry-standard (g/dscf)	0.000000	0.0001230	0.0001287	0.0001433
Total PM Emissions (g)	0.00	5.71	5.97	3.80
Particulate Emission Rate (g/hr)	0.00	3.26	3.41	3.80
Emissions Factor (g/kg)	-	0.82	0.86	-
Difference from Average Total Particulate Emissions (g)	-	0.13	0.13	-
Difference from Average Total Particulate Emissions (%)	-	2.2%	2.2%	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	5.84
Particulate Emission Rate (g/hr)	3.34
Emissions Factor (g/kg)	0.84
HHV Efficiency (%)	78.9%
LHV Efficiency (%)	84.5%
CO Emissions (g/min)	1.01

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: 82.6/Max: 87.4	OK
Face Velocity	< 30 ft/min	9.2	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:70.1/Max:81.9	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/21/22  
**Run:** 5  
**Control #:** 22-835  
**Test Duration:** 75  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	78.9%	84.5%
<b>Combustion Efficiency</b>	98.3%	98.3%
<b>Heat Transfer Efficiency</b>	80.2%	86.0%

<b>Output Rate (kJ/h)</b>	45,690	43,342	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	3.08	6.79	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	57,920	54,943	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	3.85	8.49	<b>dry lb</b>
<b>MC wet (%)</b>	17.32		
<b>MC dry (%)</b>	20.95		
<b>Particulate (g)</b>	5.84		
<b>CO (g)</b>	76		
<b>Test Duration (h)</b>	1.25		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.10	1.33
<b>g/kg Dry Fuel</b>	1.52	19.68
<b>g/h</b>	4.67	60.63
<b>g/min</b>	0.08	1.01
<b>lb/MM Btu Output</b>	0.24	3.08

<b>Air/Fuel Ratio (A/F)</b>	8.64
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VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/21/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.97  
 Max Allowable Start-up Fuel Weight (lbs): 4.46

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	15.75	2.47	In Range	26.9	19.5	19.9	22.1	In Range	2.02	0.92	
2	16.00	3.18	In Range	26.8	16.2	15.9	19.6	In Range	2.66	1.21	
3	15.75	3.04	In Range	28.2	15.4	15.4	19.7	In Range	2.54	1.15	
Core Load Wt. (lbs)		8.69	In Range								

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	15.75	2.47	In Range	22.7	26.8	16.8	22.1	In Range	2.02	0.92	
2	16.25	3.70	In Range	30.3	18.4	16.2	21.6	In Range	3.04	1.38	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.17	In Range								

Total Load Weight (lbs): 14.86 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: 103% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.3  
 Total Load Average Moisture Content (%DB): 20.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.3  
 Total Test Load Weight (dry basis): 12.29 lbs 5.57 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.85	In Range	10	10	10	10.0	In Range	2.59	1.17

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.44	In Range	27.1	15.1	17.7	20.0	In Range	3.70	1.68

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 3.0  
 Actual Residual Start-up Fuel Weight (lb): 1.77 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.3 to 1.63 lb  
 Actual Fuel Load Ending Weight (lb): 1.45 In Range

Total Weight All Fuel Added: 22.15 lbs, wet basis  
 18.58 lbs, dry basis  
 8.43 kg, dry basis

Total Weight All Fuel Burned (dry basis): 15.36 lbs  
 6.97 kg

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5  
 Test Start Time: 10:42  
 Test Type: High Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 105  
 High Fire Test Load Time (min): 30

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.85	29.82	29.84
Relative Humidity (%)	25.9	25.7	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	23.219 ft <sup>3</sup>		

### Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.111	70
2	0.134	70
3	0.133	70
4	0.118	70
5	0.094	70
6	0.128	70
7	0.135	70
8	0.119	70
Center	0.137	70

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 23.14 ft/sec  
 V<sub>scnt</sub>: 24.61 ft/sec  
 F<sub>p</sub>: 0.940 [ratio]

Initial Tunnel Flow: 471.7 scf/min

Static Pressure: -0.284 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 5

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/21/2022

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

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.137	0.00	71.7	0.28		7.29		74.4	118.7	83.0	70.1
1			0.137	0.00	71.7	0.29	-	7.19	-0.09	75.6	156.3	82.8	70.1
2			0.137	0.00	71.7	0.30	-	7.74	0.55	73.3	186.6	82.8	70.2
3			0.136	0.00	71.6	0.33	-	6.98	-0.76	75.3	258.6	82.7	70.2
4			0.136	0.00	71.6	0.33	-	6.84	-0.14	77.5	332.1	83.2	70.4
5			0.134	0.00	71.5	0.36	-	6.63	0.24	79.5	385.1	83.6	70.6
6			0.134	0.00	71.5	0.39	-	6.44	-0.19	81.2	423.0	83.8	71.2
7			0.133	0.00	71.5	0.40	-	6.26	-0.17	82.9	454.5	83.9	71.3
8			0.133	0.00	71.5	0.42	-	6.07	-0.20	85.0	477.7	84.0	71.7
9			0.131	0.00	71.5	0.44	-	5.90	-0.17	86.4	486.7	84.1	71.7
10	1.693	0.169	0.130	0.00	71.6	0.46	97	5.71	-0.19	87.9	499.3	84.3	71.8
11			0.130	0.00	71.6	0.45	-	5.47	-0.23	90.8	537.9	84.5	71.9
12			0.130	0.00	71.5	0.48	-	5.21	-0.26	92.9	567.5	84.8	72.2
13			0.130	0.00	71.5	0.47	-	4.99	-0.22	94.3	578.0	84.9	72.5
14			0.129	0.00	71.4	0.47	-	4.78	-0.21	95.2	578.2	85.2	72.7
15			0.129	0.00	71.4	0.48	-	4.55	-0.23	96.0	574.9	85.4	73.0
16			0.128	0.00	71.3	0.48	-	4.35	-0.21	96.4	571.6	85.5	73.4
17			0.128	0.00	71.4	0.46	-	4.14	-0.21	96.9	569.3	85.7	73.6
18			0.129	0.00	71.4	0.46	-	3.91	-0.23	97.8	575.0	85.9	73.9
19			0.130	0.00	71.4	0.46	-	3.67	-0.24	98.9	585.7	85.9	74.1
20	3.381	0.169	0.129	0.00	71.5	0.47	99	3.44	-0.23	99.6	589.0	85.8	74.3
21			0.128	0.00	71.5	0.49	-	3.23	-0.22	100.3	591.8	85.7	74.7
22			0.127	0.00	71.4	0.48	-	2.99	-0.23	101.4	600.5	85.8	75.1
23			0.130	0.00	71.4	0.48	-	2.77	-0.23	102.3	615.1	86.0	75.4
24			0.129	0.00	71.5	0.48	-	2.55	-0.22	103.1	620.2	86.2	75.6
25			0.130	0.00	71.4	0.49	-	2.38	-0.17	102.3	615.5	86.3	75.5
26			0.131	0.00	71.3	0.49	-	2.22	-0.16	98.2	599.4	86.5	76.1
27			0.131	0.00	71.4	0.49	-	2.07	-0.15	96.8	589.5	86.5	77.0
28			0.131	0.00	71.3	0.48	-	1.92	-0.15	96.4	583.6	86.4	77.8
29			0.128	0.00	71.4	0.49	-	1.78	-0.14	98.4	578.5	86.5	76.9
30	5.071	0.169	0.121	0.00	71.4	0.52	103	11.71	9.93	134.2	582.7	86.9	75.2
31			0.127	0.00	71.4	0.52	-	14.54	2.83	123.1	545.2	85.1	75.5
32			0.130	0.00	71.5	0.52	-	14.38	-0.16	106.9	551.9	84.7	75.8

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.130	0.00	71.5	0.52	-	14.21	-0.17	103.7	564.0	84.4	75.8
34			0.130	0.00	71.6	0.53	-	14.01	-0.20	103.2	569.9	85.1	76.7
35			0.131	0.00	71.6	0.52	-	13.83	-0.18	103.4	568.1	85.6	77.5
36			0.127	0.00	71.6	0.51	-	13.66	-0.17	103.9	563.4	86.0	77.8
37			0.129	0.00	71.6	0.51	-	13.50	-0.16	103.9	559.2	86.2	77.9
38			0.128	0.00	71.6	0.52	-	13.34	-0.16	103.8	554.1	86.5	77.9
39			0.128	0.00	71.7	0.53	-	13.19	-0.15	103.9	549.4	86.6	78.1
40	6.769	0.170	0.127	0.00	71.7	0.51	104	13.04	-0.15	103.9	546.0	86.7	78.5
41			0.129	0.00	71.6	0.52	-	12.90	-0.14	103.8	541.4	86.6	78.3
42			0.129	0.00	71.6	0.52	-	12.75	-0.15	103.4	534.8	86.6	78.5
43			0.130	0.00	71.6	0.52	-	12.61	-0.14	103.4	532.1	86.8	78.7
44			0.131	0.00	71.6	0.51	-	12.49	-0.12	100.6	529.9	86.8	79.2
45			0.129	0.00	71.6	0.51	-	12.34	-0.15	102.0	529.2	86.9	80.0
46			0.130	0.00	71.6	0.51	-	12.19	-0.15	102.9	528.1	87.0	79.7
47			0.130	0.00	71.5	0.51	-	12.05	-0.14	103.3	528.9	86.2	79.3
48			0.131	0.00	71.6	0.51	-	11.91	-0.14	103.0	529.0	85.4	79.0
49			0.132	0.00	71.5	0.51	-	11.77	-0.14	102.5	528.2	84.9	79.9
50	8.463	0.169	0.130	0.00	71.5	0.51	101	11.63	-0.14	102.8	529.2	84.4	80.3
51			0.132	0.00	71.4	0.51	-	11.48	-0.15	103.3	532.9	84.0	80.4
52			0.129	0.00	71.3	0.51	-	11.32	-0.16	104.0	538.1	83.8	80.8
53			0.130	0.00	71.3	0.50	-	11.14	-0.17	104.7	545.1	83.4	81.1
54			0.129	0.00	71.3	0.51	-	10.98	-0.16	105.1	550.2	83.2	81.1
55			0.129	0.00	71.4	0.50	-	10.80	-0.18	105.7	557.2	82.8	81.0
56			0.130	0.00	71.3	0.50	-	10.61	-0.19	106.2	562.7	82.6	81.1
57			0.127	0.00	71.3	0.50	-	10.43	-0.18	107.1	577.9	82.9	81.8
58			0.129	0.00	71.3	0.52	-	10.20	-0.23	108.7	602.1	83.3	81.9
59			0.125	0.00	71.4	0.51	-	9.96	-0.24	110.4	622.7	83.3	81.9
60	10.154	0.169	0.126	0.00	71.4	0.52	101	9.72	-0.24	111.9	641.8	83.6	81.4
61			0.127	0.00	71.6	0.52	-	9.53	-0.20	112.5	660.6	83.9	79.1
62			0.126	0.00	71.6	0.54	-	9.32	-0.20	112.5	678.1	84.3	78.1
63			0.129	0.00	71.7	0.54	-	9.11	-0.22	113.0	692.9	84.5	77.6
64			0.127	0.00	71.8	0.54	-	8.89	-0.22	114.3	718.5	84.8	77.0
65			0.128	0.00	71.9	0.55	-	8.62	-0.26	116.1	751.8	85.1	77.9



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.127	0.00	72.0	0.54	-	8.36	-0.27	118.1	776.1	85.3	78.1
67			0.127	0.00	72.0	0.56	-	8.06	-0.29	119.1	785.6	85.5	78.2
68			0.125	0.00	72.0	0.57	-	7.80	-0.27	120.1	791.2	85.7	78.3
69			0.126	0.00	72.0	0.57	-	7.53	-0.27	120.3	788.5	85.8	77.9
70	11.834	0.168	0.125	0.00	72.0	0.57	102	7.28	-0.25	120.4	780.0	85.9	78.0
71			0.125	0.00	72.0	0.58	-	7.02	-0.26	120.1	774.1	86.2	78.7
72			0.125	0.00	71.9	0.58	-	6.78	-0.24	120.0	770.4	86.4	78.1
73			0.126	0.00	71.9	0.58	-	6.52	-0.26	120.4	772.5	86.6	78.1
74			0.125	0.00	71.9	0.59	-	6.27	-0.25	120.4	776.2	86.7	77.8
75			0.125	0.00	71.9	0.59	-	6.03	-0.24	121.1	784.1	86.9	77.7
76			0.126	0.00	71.9	0.60	-	5.76	-0.26	121.7	791.5	86.8	79.0
77			0.124	0.00	72.0	0.60	-	5.51	-0.25	122.5	798.0	86.5	78.7
78			0.124	0.00	72.0	0.60	-	5.24	-0.27	123.1	803.6	86.4	78.6
79			0.124	0.00	71.9	0.60	-	4.99	-0.25	123.4	802.4	86.0	78.8
80	13.510	0.168	0.125	0.00	71.9	0.61	103	4.73	-0.26	123.7	803.8	85.8	79.3
81			0.126	0.00	72.0	0.62	-	4.48	-0.25	124.1	804.6	85.8	79.2
82			0.124	0.00	71.9	0.62	-	4.23	-0.25	124.0	800.7	85.7	78.6
83			0.121	0.00	72.0	0.63	-	4.00	-0.23	123.7	786.0	85.7	79.9
84			0.121	0.00	72.0	0.63	-	3.81	-0.19	122.6	767.5	85.5	80.2
85			0.122	0.00	72.0	0.65	-	3.61	-0.19	121.8	757.0	85.4	80.3
86			0.124	0.00	72.0	0.65	-	3.40	-0.21	121.3	752.4	85.4	80.1
87			0.126	0.00	72.0	0.67	-	3.21	-0.19	120.6	748.7	85.1	79.6
88			0.126	0.00	72.0	0.67	-	3.02	-0.19	120.4	741.3	85.0	79.3
89			0.128	0.00	72.1	0.65	-	2.85	-0.18	119.4	729.7	84.9	80.2
90	15.157	0.165	0.128	0.00	72.0	0.67	100	2.69	-0.16	118.2	717.5	84.6	80.6
91			0.127	0.00	72.0	0.67	-	2.53	-0.16	117.4	707.2	84.6	80.2
92			0.126	0.00	71.9	0.68	-	2.37	-0.16	116.6	692.5	84.5	80.6
93			0.130	0.00	71.9	0.68	-	2.24	-0.13	115.2	674.6	84.4	80.6
94			0.130	0.00	71.8	0.69	-	2.12	-0.13	114.1	657.7	84.4	79.7
95			0.127	0.00	71.9	0.69	-	2.04	-0.08	112.8	644.0	84.3	80.4
96			0.130	0.00	71.9	0.69	-	1.94	-0.09	111.6	632.1	84.2	80.6
97			0.131	0.00	71.9	0.69	-	1.85	-0.09	110.8	621.4	84.0	80.3
98			0.131	0.00	71.9	0.70	-	1.78	-0.07	110.1	612.6	83.8	80.5

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.130	0.00	71.9	0.70	-	1.72	-0.05	109.5	603.6	83.8	79.9
100	16.820	0.166	0.128	0.00	71.9	0.69	100	1.66	-0.07	108.8	595.1	83.5	79.4
101			0.130	0.00	71.9	0.69	-	1.59	-0.07	108.0	585.7	83.5	79.9
102			0.132	0.00	71.8	0.69	-	1.54	-0.05	107.1	575.2	83.3	80.4
103			0.131	0.00	71.9	0.68	-	1.48	-0.05	106.3	565.8	83.4	79.3
104			0.132	0.00	71.9	0.68	-	1.45	-0.04	105.5	555.8	83.2	80.0
105	17.657	0.167	0.131	0.00	71.9	0.68	100	1.44	-0.01	105.4	555.6	83.2	80.0
Avg/Tot	17.657	0.168	0.129	0.00	71.7	0.54	101			106.5	606.4	85.0	77.5

Data from 12/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	71.0	0.45		86.2	-0.035	1.70	0.000	27.4	34.0
1			0.00	71.0	0.51	-	86.4	-0.041	1.73	0.000	29.4	39.9
2			0.00	71.0	0.43	-	86.2	-0.053	4.42	0.047	28.0	40.5
3			0.00	71.0	0.55	-	86.2	-0.072	8.08	0.071	29.8	39.0
4			0.00	70.9	0.50	-	86.3	-0.078	10.09	0.149	33.8	43.7
5			0.00	70.8	0.52	-	86.3	-0.083	11.08	0.139	35.4	47.1
6			0.00	70.8	0.60	-	86.2	-0.085	11.59	0.282	35.3	48.9
7			0.00	70.8	0.64	-	86.4	-0.088	11.76	0.286	34.7	49.8
8			0.00	70.8	0.57	-	86.4	-0.091	11.58	0.168	34.2	50.9
9			0.00	70.8	0.66	-	86.6	-0.090	11.67	0.054	32.5	51.1
10	1.719	0.172	0.00	70.8	0.57	99	86.6	-0.092	11.38	0.016	31.1	51.3
11			0.00	70.8	0.63	-	86.7	-0.099	13.72	0.151	30.3	51.8
12			0.00	70.8	0.62	-	86.8	-0.101	15.45	0.560	31.2	55.0
13			0.00	70.7	0.70	-	87.1	-0.101	14.40	0.444	30.4	56.3
14			0.00	70.6	0.71	-	87.3	-0.100	13.46	0.262	28.8	56.1
15			0.00	70.6	0.72	-	87.4	-0.099	13.41	0.364	27.5	55.4
16			0.00	70.5	0.63	-	87.3	-0.098	13.22	0.270	27.1	55.8
17			0.00	70.6	0.63	-	87.3	-0.099	13.54	0.234	26.7	55.8
18			0.00	70.6	0.62	-	87.3	-0.101	14.48	0.240	26.3	55.9
19			0.00	70.6	0.70	-	86.7	-0.102	14.99	0.342	26.3	56.7
20	3.414	0.169	0.00	70.7	0.65	99	86.4	-0.099	15.03	0.237	26.1	57.2
21			0.00	70.7	0.63	-	86.0	-0.100	14.99	0.337	25.0	56.7
22			0.00	70.6	0.67	-	85.5	-0.102	15.31	0.343	24.5	56.8
23			0.00	70.6	0.73	-	85.0	-0.103	16.01	0.427	24.1	57.0
24			0.00	70.6	0.64	-	84.7	-0.103	15.90	0.354	23.7	57.4
25			0.00	70.6	0.71	-	84.2	-0.102	14.90	0.248	22.8	57.0
26			0.00	70.4	0.64	-	83.9	-0.099	13.31	0.086	21.7	55.6
27			0.00	70.5	0.72	-	83.5	-0.099	12.66	0.016	22.3	52.7
28			0.00	70.4	0.70	-	83.1	-0.098	12.68	0.022	22.3	51.6
29			0.00	70.5	0.68	-	82.8	-0.098	12.49	0.023	22.3	51.3
30	5.108	0.169	0.00	70.5	0.71	103	82.7	-0.107	6.53	0.027	21.6	51.3
31			0.00	70.6	0.73	-	82.8	-0.095	3.80	0.086	13.3	57.9
32			0.00	70.6	0.73	-	82.9	-0.099	11.10	0.018	12.7	54.9
33			0.00	70.6	0.66	-	83.2	-0.100	12.38	0.028	19.3	55.4
34			0.00	70.7	0.74	-	83.7	-0.099	13.00	0.000	20.7	55.8
35			0.00	70.7	0.71	-	84.1	-0.099	12.12	0.000	21.2	55.8
36			0.00	70.7	0.66	-	84.7	-0.098	11.33	0.000	20.7	55.2
37			0.00	70.7	0.70	-	85.0	-0.097	10.87	0.005	20.5	54.9
38			0.00	70.7	0.71	-	85.5	-0.097	10.55	0.033	20.1	54.5

Data from 12/21/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	70.7	0.73	-	85.8	-0.096	10.35	0.038	20.0	54.1
40	6.806	0.170	0.00	70.8	0.66	104	85.8	-0.096	10.11	0.065	19.9	54.0
41			0.00	70.7	0.73	-	85.9	-0.096	9.67	0.124	19.7	53.8
42			0.00	70.8	0.72	-	85.9	-0.094	9.17	0.201	19.5	53.4
43			0.00	70.8	0.67	-	86.0	-0.096	9.13	0.237	19.4	53.1
44			0.00	70.7	0.73	-	86.0	-0.095	9.35	0.237	19.3	53.1
45			0.00	70.7	0.73	-	86.1	-0.096	9.35	0.232	20.5	52.2
46			0.00	70.7	0.73	-	86.1	-0.094	9.27	0.295	20.2	53.1
47			0.00	70.7	0.74	-	86.2	-0.096	9.46	0.138	19.8	53.2
48			0.00	70.8	0.68	-	86.0	-0.095	9.45	0.210	19.7	53.2
49			0.00	70.7	0.67	-	85.8	-0.097	9.43	0.186	19.8	53.2
50	8.500	0.169	0.00	70.7	0.72	100	86.0	-0.095	9.65	0.133	20.1	53.2
51			0.00	70.6	0.73	-	86.0	-0.096	10.09	0.119	20.3	53.8
52			0.00	70.5	0.74	-	86.1	-0.098	10.69	0.068	20.3	54.1
53			0.00	70.4	0.70	-	86.1	-0.099	11.29	0.072	20.3	54.7
54			0.00	70.4	0.67	-	86.2	-0.099	11.65	0.050	20.3	55.2
55			0.00	70.4	0.66	-	86.2	-0.099	11.89	0.098	20.3	55.6
56			0.00	70.4	0.66	-	86.1	-0.099	12.03	0.101	20.3	56.1
57			0.00	70.4	0.73	-	86.0	-0.102	12.89	0.330	20.3	56.5
58			0.00	70.4	0.71	-	86.1	-0.105	14.60	0.331	20.5	57.4
59			0.00	70.4	0.70	-	86.4	-0.107	15.23	0.552	20.7	59.0
60	10.188	0.169	0.00	70.5	0.75	101	86.4	-0.109	15.91	0.533	20.5	60.1
61			0.00	70.6	0.68	-	86.6	-0.109	16.38	0.497	20.3	60.8
62			0.00	70.7	0.75	-	86.8	-0.109	16.65	0.567	20.1	61.3
63			0.00	70.7	0.69	-	86.9	-0.109	17.09	0.614	20.4	61.7
64			0.00	70.8	0.74	-	87.1	-0.109	17.42	0.679	20.3	61.9
65			0.00	70.9	0.70	-	87.2	-0.109	18.37	0.575	20.1	62.6
66			0.00	71.0	0.78	-	87.2	-0.109	18.88	0.663	19.7	63.5
67			0.00	71.0	0.73	-	87.2	-0.109	19.43	0.694	19.2	64.4
68			0.00	71.0	0.77	-	86.9	-0.109	19.36	0.601	18.8	64.6
69			0.00	71.0	0.73	-	86.7	-0.109	19.17	0.532	18.3	64.8
70	11.869	0.168	0.00	71.0	0.77	102	86.4	-0.109	18.85	0.448	17.9	64.4
71			0.00	71.0	0.71	-	86.2	-0.109	18.71	0.377	17.8	64.0
72			0.00	71.0	0.80	-	85.9	-0.109	18.71	0.372	17.5	63.7
73			0.00	71.0	0.77	-	85.7	-0.109	18.81	0.319	17.5	63.5
74			0.00	71.0	0.72	-	85.5	-0.109	18.93	0.305	17.3	63.5
75			0.00	71.0	0.77	-	85.2	-0.109	19.23	0.335	17.3	63.3
76			0.00	71.0	0.73	-	85.3	-0.109	19.43	0.343	17.1	63.5
77			0.00	71.0	0.71	-	85.2	-0.109	19.57	0.404	16.8	63.7

Data from 12/21/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	71.0	0.79	-	85.0	-0.109	19.72	0.584	16.6	63.9
79			0.00	71.0	0.80	-	85.1	-0.109	19.73	0.798	16.4	63.9
80	13.545	0.168	0.00	71.0	0.75	102	85.1	-0.109	19.72	0.812	16.3	63.7
81			0.00	71.0	0.75	-	85.1	-0.109	19.73	0.760	16.1	63.3
82			0.00	71.0	0.78	-	84.9	-0.109	19.73	0.689	15.9	63.0
83			0.00	71.0	0.82	-	84.9	-0.109	19.57	0.309	15.7	62.6
84			0.00	71.0	0.77	-	84.7	-0.109	18.06	0.200	15.4	62.1
85			0.00	71.0	0.84	-	84.6	-0.109	17.80	0.214	15.2	61.5
86			0.00	71.1	0.82	-	84.7	-0.109	18.00	0.210	15.3	61.0
87			0.00	71.1	0.79	-	84.6	-0.109	18.28	0.221	15.3	60.8
88			0.00	71.1	0.78	-	84.5	-0.109	18.18	0.215	15.4	60.4
89			0.00	71.1	0.81	-	84.4	-0.109	17.32	0.128	15.3	59.9
90	15.192	0.165	0.00	71.1	0.89	100	84.4	-0.109	16.50	0.091	15.0	58.8
91			0.00	71.1	0.82	-	84.4	-0.108	15.84	0.082	15.0	57.7
92			0.00	71.0	0.82	-	84.3	-0.107	15.03	0.115	14.9	57.0
93			0.00	71.1	0.89	-	84.2	-0.105	13.84	0.062	14.8	56.1
94			0.00	71.0	0.90	-	84.1	-0.104	12.75	0.038	14.5	54.5
95			0.00	71.0	0.87	-	84.0	-0.103	12.01	0.000	14.2	53.4
96			0.00	71.0	0.89	-	83.9	-0.103	11.44	0.000	14.3	52.3
97			0.00	71.1	0.85	-	83.9	-0.101	11.14	0.000	14.4	51.6
98			0.00	71.0	0.81	-	83.7	-0.100	10.81	0.000	14.2	50.7
99			0.00	71.1	0.84	-	83.7	-0.099	10.49	0.000	14.2	50.2
100	16.857	0.167	0.00	71.0	0.87	99	83.6	-0.100	10.14	0.000	14.1	49.5
101			0.00	71.1	0.87	-	83.5	-0.097	9.72	0.000	13.9	48.6
102			0.00	71.0	0.82	-	83.4	-0.096	9.30	0.000	13.8	47.7
103			0.00	71.1	0.88	-	83.3	-0.095	8.87	0.000	13.7	46.8
104			0.00	71.1	0.83	-	83.1	-0.092	8.54	0.000	13.6	46.0
105	17.695	0.168	0.00	71.1	0.90	101	83.1	-0.093	8.54	0.000	13.5	45.1
Avg/Tot	17.695	0.168	0.00	70.8	0.72	101	85.4	-0.099	13.42	0.232	20.56	55.498

Data from 12/21/2022 testing - Reference only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	68.9	0.00		83.4
1			0.00	68.9	0.00	-	83.3
2			0.00	69.0	0.00	-	82.9
3			0.00	68.9	0.00	-	83.0
4			0.00	68.9	0.00	-	83.5
5			0.00	68.9	0.00	-	84.0
6			0.00	69.0	0.00	-	84.3
7			0.00	68.9	0.00	-	84.7
8			0.00	68.9	0.00	-	84.9
9			0.00	69.0	0.00	-	85.2
10	2.098	0.210	0.00	69.0	0.00	96	85.6
11			0.00	69.0	0.00	-	86.1
12			0.00	69.0	0.00	-	86.7
13			0.00	69.0	0.00	-	87.0
14			0.00	69.0	0.00	-	87.4
15			0.00	69.0	0.00	-	87.4
16			0.00	69.0	0.00	-	87.3
17			0.00	69.0	0.00	-	87.2
18			0.00	69.1	0.00	-	87.3
19			0.00	69.1	0.00	-	87.1
20	4.154	0.206	0.00	69.1	0.00	96	86.8
21			0.00	69.1	0.00	-	86.6
22			0.00	69.1	0.00	-	86.5
23			0.00	69.0	0.00	-	86.4
24			0.00	69.0	0.00	-	86.3
25			0.00	69.1	0.00	-	86.1
26			0.00	69.1	0.00	-	85.5
27			0.00	69.0	0.00	-	85.1
28			0.00	69.1	0.00	-	84.6
29			0.00	69.0	0.00	-	84.5
30	6.230	0.208	0.00	69.1	0.00	101	87.5
31			0.00	69.1	0.00	-	86.7

Data from 12/2022 testing - Reference only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	69.2	0.00	-	82.9
33			0.00	69.2	0.00	-	82.7
34			0.00	69.2	0.00	-	83.9
35			0.00	69.2	0.00	-	85.1
36			0.00	69.3	0.00	-	86.0
37			0.00	69.3	0.00	-	86.7
38			0.00	69.3	0.00	-	87.6
39			0.00	69.4	0.00	-	87.9
40	8.321	0.209	0.00	69.5	0.00	102	87.6
41			0.00	69.5	0.00	-	87.4
42			0.00	69.5	0.00	-	87.3
43			0.00	69.5	0.00	-	87.3
44			0.00	69.5	0.00	-	87.0
45			0.00	69.5	0.00	-	86.9
46			0.00	69.5	0.00	-	87.1
47			0.00	69.4	0.00	-	87.0
48			0.00	69.5	0.00	-	86.8
49			0.00	69.5	0.00	-	86.4
50	10.443	0.212	0.00	69.5	0.00	100	86.4
51			0.00	69.5	0.00	-	86.3
52			0.00	69.5	0.00	-	86.3
53			0.00	69.5	0.00	-	86.3
54			0.00	69.5	0.00	-	86.2
55			0.00	69.5	0.00	-	86.1
56			0.00	69.5	0.00	-	86.1
57			0.00	69.5	0.00	-	86.2
58			0.00	69.5	0.00	-	86.6
59			0.00	69.5	0.00	-	86.8
60	12.643	0.220	0.00	69.5	0.00	105	4184.7
Avg/Tot	12.643	0.211	0.00	69.2	0.00	100	153.2

Data from 12/2022 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	83.9	70.1	70.6	70.4	70.2	73.0	0
1	101.1	70.0	71.2	70.5	70.2	76.6	0
2	119.4	70.0	72.8	70.7	70.4	80.7	0
3	160.6	70.0	75.3	71.4	70.9	89.6	0
4	229.6	70.0	78.9	72.3	71.6	104.5	0
5	301.1	70.1	84.1	73.8	72.7	120.4	0
6	367.8	70.2	90.8	75.9	74.2	135.8	0
7	426.3	70.5	98.4	78.5	76.3	150.0	0
8	475.9	70.9	106.6	81.9	79.0	162.8	0
9	514.6	71.4	114.9	86.0	82.3	173.8	0
10	540.7	72.1	122.9	90.5	86.0	182.5	0
11	570.1	72.9	130.6	95.8	90.3	191.9	0
12	607.8	73.9	138.4	101.7	95.3	203.4	0
13	641.6	75.0	146.3	107.9	100.9	214.4	0
14	669.5	76.6	154.1	114.4	107.0	224.3	0
15	692.3	78.4	161.6	121.1	113.5	233.4	0
16	709.3	80.7	169.3	127.6	120.5	241.5	0
17	723.1	83.4	177.4	133.6	127.8	249.0	0
18	735.5	86.6	186.2	140.0	135.3	256.8	0
19	748.2	90.3	195.9	146.4	142.9	264.8	0
20	760.3	94.4	205.4	153.2	150.6	273.0	0
21	771.2	98.8	215.5	160.6	158.3	281.3	0
22	782.4	103.6	228.8	168.5	166.0	289.9	0
23	795.5	108.6	240.2	176.7	173.4	298.9	0
24	809.1	113.8	251.6	185.1	180.6	308.1	0
25	818.5	119.3	263.1	193.7	188.3	316.6	0
26	821.6	125.2	274.2	202.4	196.3	324.0	0
27	821.7	131.4	284.9	211.4	204.4	330.8	0
28	821.0	137.8	295.0	220.4	212.5	337.3	0
29	818.1	144.2	304.8	229.0	220.6	343.3	0
30	800.9	151.3	316.3	237.7	229.3	347.1	0
31	765.5	158.4	328.3	245.9	237.3	347.1	0
32	748.5	164.8	333.5	253.9	244.7	349.1	0
33	742.1	171.2	333.5	261.5	251.6	352.0	0
34	741.6	177.8	331.4	268.8	258.2	355.6	0
35	741.5	183.9	328.6	275.1	263.8	358.6	0
36	739.0	189.9	326.1	281.1	269.0	361.0	0
37	734.3	195.6	323.8	286.6	273.5	362.8	0
38	728.8	201.0	321.8	291.4	277.2	364.0	0
39	722.3	206.0	320.0	295.8	280.4	364.9	0
40	715.2	210.5	318.5	299.7	283.1	365.4	0
41	708.9	214.9	317.2	303.3	285.4	365.9	0
42	701.8	219.0	316.0	306.5	287.4	366.1	0
43	695.0	222.7	315.0	309.5	289.1	366.2	0
44	689.6	226.5	314.2	312.2	290.8	366.7	0
45	685.8	229.9	313.3	314.4	292.1	367.1	0
46	682.9	233.2	312.5	316.6	292.9	367.6	0
47	681.1	236.2	311.9	318.6	293.6	368.3	0

Data from 12/20/22 testing - Reference only



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	679.4	239.1	311.4	320.5	294.3	368.9	0
49	676.5	241.9	310.9	322.1	294.9	369.3	0
50	674.5	244.7	310.7	323.7	295.4	369.8	0
51	673.7	247.5	310.5	325.1	295.7	370.5	0
52	674.5	250.3	310.5	326.4	296.1	371.6	0
53	676.7	252.9	310.7	327.7	296.4	372.9	0
54	679.8	255.6	311.1	328.8	296.8	374.4	0
55	685.1	258.2	311.7	329.7	297.4	376.4	0
56	690.8	260.8	312.4	330.7	298.3	378.6	0
57	697.8	263.4	313.3	331.6	299.3	381.1	0
58	708.3	266.0	314.2	332.6	300.6	384.3	0
59	721.6	268.6	315.1	333.6	302.1	388.2	0
60	737.3	271.3	316.4	334.5	303.9	392.7	0
61	752.5	273.2	318.0	334.3	305.4	396.7	0
62	767.5	274.9	319.9	334.8	307.5	400.9	0
63	781.9	276.7	322.0	335.7	309.6	405.2	0
64	794.4	278.7	324.3	336.8	312.2	409.3	0
65	805.9	280.7	327.0	338.4	315.2	413.4	0
66	817.6	283.0	330.1	340.1	318.5	417.9	0
67	830.4	285.6	333.6	342.0	321.9	422.7	0
68	843.3	288.3	337.7	344.0	325.6	427.8	0
69	855.7	291.0	341.9	346.2	329.4	432.8	0
70	866.3	293.8	346.2	348.3	333.3	437.6	0
71	875.4	296.7	350.5	350.9	337.2	442.2	0
72	884.5	299.8	355.1	353.3	341.2	446.8	0
73	892.6	303.0	359.9	355.6	345.3	451.3	0
74	900.0	306.2	364.7	358.2	349.3	455.7	0
75	907.2	309.5	369.7	360.6	353.1	460.0	0
76	914.1	312.9	375.1	363.3	357.0	464.5	0
77	920.6	316.3	380.6	365.7	360.7	468.8	0
78	926.7	319.8	386.3	368.4	364.3	473.1	0
79	933.0	323.4	392.2	370.8	367.9	477.5	0
80	939.1	327.1	398.3	373.5	371.3	481.8	0
81	944.3	331.0	404.5	376.2	374.7	486.1	0
82	948.9	334.8	410.9	379.0	377.7	490.3	0
83	952.4	338.8	417.4	381.7	380.9	494.3	0
84	952.6	342.6	424.4	384.1	384.1	497.5	0
85	951.5	346.6	431.3	386.9	387.0	500.7	0
86	952.0	350.6	438.3	389.5	390.1	504.1	0
87	954.5	354.5	445.4	392.0	393.0	507.9	0
88	957.9	358.4	452.6	394.3	396.0	511.8	0
89	959.1	362.2	459.8	396.6	398.9	515.3	0
90	955.4	366.3	467.0	399.0	401.9	517.9	0
91	947.6	370.2	474.2	401.4	404.8	519.7	0
92	936.1	374.1	481.3	403.5	407.7	520.5	0
93	921.8	378.1	488.2	405.8	410.5	520.9	0
94	905.4	382.1	494.6	407.7	413.3	520.6	0
95	888.4	386.0	500.6	409.3	415.8	520.0	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
96	872.2	390.0	506.5	411.2	418.3	519.6	0
97	857.0	393.9	512.4	413.3	420.4	519.4	0
98	843.0	397.7	518.3	415.0	422.6	519.3	0
99	829.9	401.4	524.7	416.3	424.3	519.3	0
100	816.5	404.9	531.5	417.7	426.0	519.3	0
101	803.1	408.4	538.5	419.3	427.5	519.4	0
102	789.6	411.8	545.5	420.3	428.8	519.2	0
103	776.0	415.1	551.7	421.5	429.7	518.8	0
104	762.0	418.2	557.3	422.2	430.7	518.1	0
105	761.7	418.2	557.4	422.3	430.7	518.0	0
Average	744.2	235.5	321.0	286.6	277.4	373	0

Data from 12/2022 testing - Reference only

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

		Sample ID	Tare, mg		Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0128	187.5		189.7	2.2
	<b>B</b>	H0129	187.4		189.6	2.2
	<b>C - 1st Hour</b>	H0130	187.9		189.7	1.8
	<b>Amb</b>	H0150	89.5		89.5	0.0
<b>Probes</b>	<b>A</b>	15A	117239.3		117239.3	0.0
	<b>B</b>	15B	116752.0		116752.1	0.1
	<b>C - 1st Hour</b>	15C	116847.4		116847.4	0.0
<b>O-rings</b>	<b>A</b>	15A	3570.6		3570.6	0.0
	<b>B</b>	15B	3571.8		3571.8	0.0
	<b>C - 1st Hour</b>	15C	3397.5		3397.5	0.0

**Placed in Dessicator on:** 12/26/2022

<b>Filters</b>	<b>A</b>	190.2	12/21 2:11	189.9	12/31 12:00	189.7	1/3 9:43		
	<b>B</b>	190.2	12/21 2:11	189.7	12/31 12:00	189.6	1/3 9:43		
	<b>C - 1st Hour</b>	190.3	12/21 2:11	189.9	12/31 12:00	189.7	1/3 9:43		
	<b>Amb</b>	89.6	12/21 2:11	89.5	12/31 12:13	89.5	1/3 9:44		
<b>Probes</b>	<b>A</b>			117239.6	12/31 12:09	117239.3	1/3 9:44	117239.3	1/4 12:22
	<b>B</b>			116752.2	12/31 12:09	116752.1	1/3 9:44		
	<b>C - 1st Hour</b>			116847.4	12/31 12:09	116847.4	1/3 9:44		
<b>O-Rings</b>	<b>A</b>			3570.6	12/31 12:01	3570.6	1/3 9:44		
	<b>B</b>			3572.0	12/31 12:01	3571.8	1/3 9:44		
	<b>C - 1st Hour</b>			3397.4	12/31 12:01	3397.5	1/3 9:44		

<b>Train A Aggregate, mg:</b>	<b>2.2</b>
<b>Train B Aggregate, mg:</b>	<b>2.3</b>
<b>Train C Aggregate, mg:</b>	<b>1.8</b>
<b>Ambient Aggregate, mg:</b>	<b>0.0</b>

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 6 Data Summary**

Client: SBI  
Model: 5.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/21/2022

*Data from 12/21/2022 testing - reference only*

  
\_\_\_\_\_  
Technician Signature

7/12/2023  
\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBIModel: 1.7RRun #: 6Job #: 22-835Tracking #: 135Technician: AKDate: 12/21/2022

<b>Burn Rate (kg/hr):</b>	<b>1.45</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	60.774	47.537	46.450	12.453
Average Gas Velocity in Dilution Tunnel (ft/sec)	23.34			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	27317.7			
Average Gas Meter Temperature (°F)	82.0	71.8	71.1	70.2
Total Sample Volume (dscf)	59.561	48.096	46.868	12.341
Average Tunnel Temperature (°F)	53.2			
Total Time of Test (min)	278			
Total Particulate Catch (mg)	0.1	3.1	3.2	2.7
Particulate Concentration, dry-standard (g/dscf)	0.0000017	0.0000645	0.0000683	0.0002188
Total PM Emissions (g)	0.21	7.95	8.43	5.93
Particulate Emission Rate (g/hr)	0.05	1.71	1.82	5.93
Emissions Factor (g/kg)	-	1.18	1.26	-
Difference from Average Total Particulate Emissions (g)	-	0.24	0.24	-
Difference from Average Total Particulate Emissions (%)	-	3.0%	3.0%	-
Difference from Average Emissions Factor (g/kg)	-	0.04	0.04	-

Final Average Results	
Total Particulate Emissions (g)	8.19
Particulate Emission Rate (g/hr)	1.77
Emissions Factor (g/kg)	1.22
HHV Efficiency (%)	71.1%
LHV Efficiency (%)	76.1%
CO Emissions (g/min)	1.33

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 80.9/Max: 88.3	OK
Face Velocity	< 30 ft/min	9.4	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:72.3/Max:87.4	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/21/22  
**Run:** 6  
**Control #:** 22-835  
**Test Duration:** 278  
**Output Category:** Medium

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	71.1%	76.1%
<b>Combustion Efficiency</b>	96.1%	96.1%
<b>Heat Transfer Efficiency</b>	74.0%	79.2%

<b>Output Rate (kJ/h)</b>	19,352	18,358	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.45	3.19	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	27,233	25,833	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.71	14.79	<b>dry lb</b>
<b>MC wet (%)</b>	16.09		
<b>MC dry (%)</b>	19.32		
<b>Particulate (g)</b>	8.19		
<b>CO (g)</b>	370		
<b>Test Duration (h)</b>	4.63		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.09	4.13
<b>g/kg Dry Fuel</b>	1.22	55.20
<b>g/h</b>	1.77	79.96
<b>g/min</b>	0.03	1.33
<b>lb/MM Btu Output</b>	0.21	9.60

<b>Air/Fuel Ratio (A/F)</b>	14.91
-----------------------------	-------

VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/21/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.89  
 Max Allowable Start-up Fuel Weight (lbs): 4.33

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	16.00	3.06	In Range	26.8	17.9	18.9	21.2	In Range	2.53	1.15	
2	15.83	2.87	In Range	22.0	18.4	18.1	19.5	In Range	2.40	1.09	
3	15.75	2.45	In Range	26.6	16.8	18.3	20.6	In Range	2.03	0.92	
Core Load Wt. (lbs)		8.38	In Range								

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	16.00	2.38	In Range	27.0	14.3	14.2	18.5	In Range	2.01	0.91	
2	16.00	3.67	In Range	28.1	16.2	14.9	19.7	In Range	3.06	1.39	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.05	In Range								

Total Load Weight (lbs): 14.43 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: 100% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.0  
 Total Load Average Moisture Content (%DB): 19.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.6  
 Total Test Load Weight (dry basis): 12.03 lbs 5.46 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.84	In Range	10	10	10	10.0	In Range	2.58	1.17

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.19	In Range	24.6	18.8	19.9	21.1	In Range	3.46	1.57

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.4 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 1.97 In Range

## LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/21/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 12  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 17.28  
 Total Load Weight Range (lbs): 16.42 to 18.14  
 Core Load Weight Range (lbs): 7.78 to 11.23  
 Remainder Load Weight Range (lbs): 6.05 to 9.50  
 Core Load Piece Range (lbs): 2.59 to 4.32  
 Remainder Load Piece Range (lbs): 1.73 to 5.18

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	16.00	3.62	In Range	23.9	21.4	15.6	20.3	In Range	3.01	1.37	
2	16.00	3.50	In Range	22.0	17.3	16.0	18.4	In Range	2.96	1.34	
3	16.25	3.54	In Range	22.8	19.8	17.0	19.9	In Range	2.95	1.34	
Core Load Wt. (lbs)		10.66	In Range								

### REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	16.25	4.20	In Range	22.4	18.4	17.8	19.5	In Range	3.51	1.59	
2	15.75	2.79	In Range	24.6	15.6	14.3	18.2	In Range	2.36	1.07	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.99	In Range								

Remainder Load Small/Large Piece Weight Ratio: 66% In Range ≤ 67%  
 Total Load Weight (lbs): 17.65 In Range  
 Core Load % of Total Weight: 60% In Range 45-65%  
 Remainder % of Total Weight: 40% In Range 35-55%  
 Total Load % of Target Weight: 102% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 12.3  
 Total Load Average Moisture Content (%DB): 19.3 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.2  
 Total Test Load Weight (dry basis): 14.79 lbs 6.71 kg

### TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 1.8 to 3.5  
 Actual Charcoal Bed Wt. (lb): 2.79 In Range

### TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.00 Valid Test (≥90%)

Total Fuel Burned During Test Run:  
 17.7 lbs, wet basis  
 14.8 lbs, dry basis  
 6.71 kg, dry basis



## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: **SBI**  
 Model: **1.7R**  
 Run #: **6**  
 Test Start Time: **12:13**  
 Test Type: **Medium Fire**

Job #: **22-835**  
 Tracking #: **135**  
 Technician: **AK**  
 Date: **12/21/2022**

Recording Interval (min): **1**  
 Total Sampling Time (min): **278**

Meter Box  $\gamma$  Factor: **1.023** (A)  
 Meter Box  $\gamma$  Factor: **1.019** (B)  
 Meter Box  $\gamma$  Factor: **0.999** (C)  
 Meter Box  $\gamma$  Factor: **1.010** (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): **0**  
 Smoke Capture Check (%): **100**  
 Date Flue Pipe Last Cleaned: **12/16/2022**

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.82	29.81	29.82
Relative Humidity (%)	25.7	20.1	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	60.774 ft <sup>3</sup>		

### Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.111	70
2	0.134	70
3	0.133	70
4	0.118	70
5	0.094	70
6	0.128	70
7	0.135	70
8	0.119	70
Center	0.137	70

Dilution Tunnel H<sub>2</sub>O: **2.00** percent  
 Tunnel Diameter: **8** 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: **0.3491** ft<sup>2</sup>

V<sub>strav</sub>: **23.16** ft/sec  
 V<sub>scnt</sub>: **24.63** ft/sec  
 F<sub>p</sub>: **0.940** [ratio]

Initial Tunnel Flow: **471.5** scf/min

Static Pressure: **-0.284** in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 6

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/21/2022

**Medium Fire Performed as a continuation of High Fire Test, see Run 5 test data for details**

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.130	0.00	71.2	-0.47		17.65		109.7	425.8	85.7	77.6
1			0.126	0.00	72.0	0.19	-	17.63	-0.02	114.2	373.6	86.8	77.9
2			0.128	0.00	72.1	0.18	-	17.48	-0.14	116.2	364.2	85.8	78.2
3			0.127	0.00	72.1	0.20	-	17.28	-0.21	121.3	406.5	85.9	80.9
4			0.129	0.00	72.1	0.19	-	16.99	-0.29	113.0	477.4	85.6	82.5
5			0.130	0.00	72.1	0.20	-	16.77	-0.24	108.0	512.9	85.0	81.9
6			0.131	0.00	72.1	0.20	-	16.58	-0.19	107.3	534.0	84.3	82.2
7			0.130	0.00	72.2	0.21	-	16.41	-0.17	105.8	531.5	84.1	82.4
8			0.129	0.00	72.2	0.19	-	16.24	-0.17	105.4	531.5	84.2	81.6
9			0.128	0.00	72.2	0.19	-	16.10	-0.15	105.3	536.1	84.5	81.1
10	1.718	0.172	0.129	0.00	72.2	0.18	103	15.94	-0.15	104.0	537.0	84.5	81.8
11			0.130	0.00	72.2	0.18	-	15.78	-0.16	101.3	540.4	84.5	83.5
12			0.131	0.00	72.2	0.20	-	15.62	-0.16	101.2	547.9	84.5	84.0
13			0.132	0.00	72.1	0.20	-	15.44	-0.17	100.3	548.1	84.6	85.3
14			0.129	0.00	72.2	0.20	-	15.27	-0.17	100.3	546.0	84.7	85.5
15			0.128	0.00	72.2	0.19	-	15.10	-0.17	100.2	545.9	84.9	86.4
16			0.132	0.00	72.2	0.20	-	14.93	-0.17	100.2	549.6	85.1	86.7
17			0.132	0.00	72.2	0.19	-	14.81	-0.12	100.5	549.0	84.8	87.1
18			0.131	0.00	72.2	0.20	-	14.64	-0.17	100.5	549.0	84.9	87.2
19			0.131	0.00	72.2	0.19	-	14.44	-0.20	103.8	550.8	84.8	87.4
20	3.407	0.169	0.132	0.00	72.2	0.19	101	14.28	-0.16	107.1	554.8	85.0	85.5
21			0.130	0.00	72.2	0.18	-	14.10	-0.18	108.6	560.3	85.2	82.4
22			0.131	0.00	72.2	0.18	-	13.97	-0.14	106.6	564.8	85.1	82.1
23			0.129	0.00	72.2	0.18	-	13.77	-0.19	105.0	567.1	84.9	80.4
24			0.129	0.00	72.2	0.18	-	13.59	-0.18	104.6	569.4	85.0	79.1
25			0.130	0.00	72.2	0.18	-	13.38	-0.21	104.3	574.9	85.0	77.3
26			0.131	0.00	72.3	0.18	-	13.18	-0.20	104.4	585.4	85.0	77.1
27			0.132	0.00	72.2	0.18	-	12.97	-0.22	104.7	595.7	85.0	76.9
28			0.130	0.00	72.2	0.19	-	12.74	-0.23	105.2	606.3	85.2	75.6
29			0.132	0.00	72.2	0.19	-	12.49	-0.25	105.6	620.2	85.0	74.1
30	5.099	0.169	0.131	0.00	72.1	0.20	101	12.29	-0.21	106.2	633.8	85.2	74.7
31			0.129	0.00	72.2	0.20	-	12.04	-0.25	106.8	639.3	85.2	74.2
32			0.129	0.00	72.1	0.23	-	11.80	-0.24	107.1	644.1	85.3	73.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.128	0.00	72.1	0.24	-	11.57	-0.23	107.3	643.4	85.4	73.4
34			0.130	0.00	72.1	0.26	-	11.35	-0.22	107.6	643.9	85.3	73.1
35			0.130	0.00	72.2	0.27	-	11.11	-0.25	107.6	646.9	85.5	73.4
36			0.129	0.00	72.2	0.29	-	10.90	-0.21	107.8	647.9	85.4	73.4
37			0.126	0.00	72.1	0.30	-	10.66	-0.23	108.0	648.7	85.5	72.9
38			0.129	0.00	72.1	0.33	-	10.44	-0.22	107.9	648.1	85.9	73.1
39			0.127	0.00	72.1	0.33	-	10.21	-0.23	108.2	646.9	86.1	73.1
40	6.794	0.169	0.129	0.00	72.1	0.34	102	9.98	-0.23	108.1	646.7	86.0	73.0
41			0.128	0.00	72.1	0.35	-	9.77	-0.21	108.0	645.5	86.0	72.7
42			0.127	0.00	72.1	0.35	-	9.52	-0.24	108.0	646.5	86.1	72.6
43			0.128	0.00	72.1	0.35	-	9.30	-0.23	108.0	647.6	86.0	72.7
44			0.128	0.00	72.0	0.35	-	9.08	-0.22	108.3	647.7	86.0	72.5
45			0.128	0.00	72.1	0.38	-	8.87	-0.21	108.3	647.9	86.0	72.8
46			0.130	0.00	72.0	0.38	-	8.63	-0.24	108.4	650.6	86.1	72.3
47			0.128	0.00	72.0	0.39	-	8.41	-0.22	108.4	652.6	86.1	72.7
48			0.127	0.00	72.0	0.39	-	8.18	-0.23	108.3	650.7	85.8	72.7
49			0.129	0.00	72.0	0.40	-	7.96	-0.22	108.4	653.5	85.8	72.7
50	8.470	0.168	0.128	0.00	72.0	0.42	101	7.74	-0.22	108.9	655.2	85.7	72.5
51			0.126	0.00	72.0	0.43	-	7.50	-0.24	109.0	655.9	85.6	72.5
52			0.129	0.00	71.9	0.44	-	7.28	-0.22	109.1	657.2	85.7	72.9
53			0.127	0.00	71.9	0.44	-	7.05	-0.23	109.3	658.2	85.6	73.0
54			0.129	0.00	71.8	0.45	-	6.84	-0.21	109.3	658.9	85.5	72.7
55			0.128	0.00	71.8	0.45	-	6.63	-0.21	108.9	660.2	85.2	72.3
56			0.130	0.00	71.8	0.46	-	6.40	-0.23	109.0	663.2	85.3	72.8
57			0.128	0.00	71.8	0.48	-	6.17	-0.22	109.0	665.7	85.4	72.5
58			0.127	0.00	71.8	0.47	-	6.00	-0.18	108.9	664.9	85.3	73.1
59			0.128	0.00	71.8	0.49	-	5.80	-0.20	108.8	663.3	85.1	73.0
60	10.146	0.168	0.130	0.00	71.9	0.49	101	5.61	-0.19	108.7	661.3	85.1	73.5
61			0.128	0.00	71.9	0.52	-	5.42	-0.19	108.4	656.5	85.2	73.2
62			0.130	0.00	71.9	0.51	-	5.23	-0.19	108.2	651.7	85.3	73.5
63			0.131	0.00	71.9	0.51	-	5.06	-0.17	107.9	644.5	85.2	73.7
64			0.127	0.00	72.0	0.52	-	4.88	-0.17	107.3	637.2	85.0	73.6
65			0.130	0.00	72.0	0.52	-	4.74	-0.15	106.8	626.8	85.1	73.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.131	0.00	72.1	0.53	-	4.60	-0.13	106.2	615.7	85.2	73.7
67			0.133	0.00	72.1	0.53	-	4.45	-0.15	105.1	605.8	85.2	73.0
68			0.130	0.00	72.2	0.53	-	4.34	-0.11	104.6	595.3	85.2	73.7
69			0.133	0.00	72.2	0.53	-	4.22	-0.12	103.9	585.6	85.2	73.8
70	11.824	0.168	0.131	0.00	72.2	0.54	100	4.10	-0.12	103.4	577.1	85.1	73.4
71			0.129	0.00	72.1	0.55	-	3.99	-0.10	102.9	569.6	85.1	73.2
72			0.133	0.00	72.0	0.55	-	3.90	-0.09	101.9	560.9	84.8	73.2
73			0.132	0.00	72.0	0.55	-	3.79	-0.11	101.1	549.5	84.6	75.2
74			0.133	0.00	72.1	0.54	-	3.73	-0.06	100.8	539.2	84.7	76.4
75			0.131	0.00	72.0	0.53	-	3.67	-0.06	100.7	531.6	84.6	77.1
76			0.131	0.00	72.0	0.55	-	3.62	-0.05	100.0	523.9	84.4	77.5
77			0.133	0.00	72.0	0.55	-	3.58	-0.04	99.5	516.5	84.5	77.8
78			0.130	0.00	72.0	0.55	-	3.54	-0.04	99.1	509.6	84.6	77.7
79			0.132	0.00	72.0	0.55	-	3.51	-0.04	98.8	503.1	84.5	77.6
80	13.512	0.169	0.132	0.00	71.9	0.53	100	3.46	-0.05	98.4	497.8	84.7	78.2
81			0.132	0.00	71.9	0.53	-	3.42	-0.04	97.9	491.7	84.5	78.9
82			0.133	0.00	71.9	0.54	-	3.38	-0.04	97.5	486.8	84.5	78.6
83			0.132	0.00	71.8	0.54	-	3.35	-0.03	97.0	482.3	84.6	79.4
84			0.133	0.00	71.8	0.54	-	3.31	-0.04	96.8	476.9	84.5	79.6
85			0.134	0.00	71.8	0.55	-	3.29	-0.01	96.4	472.0	84.4	79.8
86			0.133	0.00	71.8	0.55	-	3.24	-0.05	96.1	467.3	84.4	79.1
87			0.134	0.00	71.8	0.54	-	3.21	-0.04	95.8	462.5	84.4	79.4
88			0.134	0.00	71.9	0.54	-	3.17	-0.04	95.4	457.7	84.2	80.0
89			0.133	0.00	71.9	0.54	-	3.12	-0.05	95.1	451.6	84.2	79.6
90	15.209	0.170	0.132	0.00	71.9	0.55	100	3.09	-0.03	94.6	445.4	84.4	78.9
91			0.131	0.00	72.0	0.54	-	3.05	-0.03	94.3	439.1	84.4	79.2
92			0.132	0.00	71.9	0.55	-	3.01	-0.04	93.9	432.2	84.3	79.0
93			0.132	0.00	72.0	0.55	-	3.00	-0.02	93.3	425.8	84.4	79.8
94			0.134	0.00	72.0	0.55	-	2.96	-0.04	92.9	418.7	84.4	79.8
95			0.135	0.00	71.9	0.54	-	2.94	-0.02	93.2	411.4	84.1	79.9
96			0.135	0.00	71.9	0.55	-	2.89	-0.05	94.2	405.3	84.1	81.4
97			0.134	0.00	71.9	0.53	-	2.83	-0.06	94.7	398.6	84.2	82.1
98			0.134	0.00	71.9	0.55	-	2.79	-0.04	95.0	394.3	84.1	82.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.134	0.00	72.0	0.54	-	2.76	-0.03	95.0	390.0	84.2	82.6
100	16.911	0.170	0.134	0.00	72.0	0.54	100	2.73	-0.03	95.1	386.2	84.2	82.7
101			0.134	0.00	72.1	0.55	-	2.68	-0.05	95.0	382.0	84.1	82.9
102			0.135	0.00	72.1	0.54	-	2.66	-0.02	94.9	375.5	84.0	82.8
103			0.134	0.00	72.2	0.56	-	2.63	-0.03	94.8	369.8	83.8	82.9
104			0.135	0.00	72.1	0.55	-	2.59	-0.04	94.5	365.9	83.9	83.1
105			0.134	0.00	72.2	0.56	-	2.57	-0.02	94.4	361.5	83.8	83.2
106			0.135	0.00	72.2	0.56	-	2.54	-0.03	94.2	358.1	83.7	83.0
107			0.134	0.00	72.2	0.56	-	2.51	-0.03	94.1	354.6	83.7	83.1
108			0.134	0.00	72.3	0.55	-	2.49	-0.03	93.8	351.5	83.5	83.7
109			0.133	0.00	72.2	0.55	-	2.46	-0.03	93.7	349.2	83.6	83.4
110	18.619	0.171	0.133	0.00	72.2	0.56	100	2.44	-0.03	93.6	346.7	83.5	83.5
111			0.133	0.00	72.1	0.56	-	2.41	-0.03	93.4	344.5	83.3	83.9
112			0.135	0.00	72.1	0.54	-	2.39	-0.02	93.2	342.6	83.3	83.4
113			0.135	0.00	72.1	0.55	-	2.38	-0.01	93.1	340.5	83.2	83.6
114			0.135	0.00	72.0	0.55	-	2.35	-0.03	93.0	338.5	83.4	83.4
115			0.134	0.00	72.0	0.55	-	2.34	-0.01	92.8	337.1	83.1	83.2
116			0.134	0.00	72.0	0.55	-	2.32	-0.01	92.6	335.8	83.1	83.2
117			0.134	0.00	72.1	0.54	-	2.30	-0.03	92.4	334.1	83.2	83.8
118			0.135	0.00	72.0	0.55	-	2.28	-0.01	92.3	331.9	83.0	83.5
119			0.134	0.00	72.1	0.55	-	2.26	-0.02	92.1	330.4	82.9	83.4
120	20.342	0.172	0.134	0.00	72.0	0.55	101	2.25	-0.01	92.0	328.8	83.1	83.5
121			0.135	0.00	72.0	0.56	-	2.23	-0.03	91.9	327.3	83.0	83.2
122			0.134	0.00	71.9	0.55	-	2.22	0.00	91.8	325.4	82.8	83.3
123			0.133	0.00	71.9	0.56	-	2.20	-0.02	91.6	324.3	82.8	83.4
124			0.135	0.00	71.8	0.56	-	2.19	-0.01	91.5	322.6	82.9	82.8
125			0.135	0.00	71.8	0.54	-	2.18	-0.01	91.3	320.7	82.8	82.9
126			0.133	0.00	71.8	0.55	-	2.17	-0.02	91.3	320.0	82.8	83.3
127			0.134	0.00	71.8	0.54	-	2.15	-0.02	91.2	318.7	82.9	83.8
128			0.135	0.00	71.8	0.55	-	2.14	0.00	91.1	317.3	82.9	83.3
129			0.134	0.00	71.8	0.55	-	2.12	-0.02	90.9	316.2	82.7	83.3
130	22.063	0.172	0.134	0.00	71.9	0.55	100	2.11	-0.01	90.9	314.6	82.8	83.3
131			0.134	0.00	71.9	0.55	-	2.10	-0.02	90.7	313.0	82.6	82.9

# BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132			0.134	0.00	71.9	0.54	-	2.09	-0.01	90.4	311.4	82.8	83.1
133			0.134	0.00	71.8	0.56	-	2.07	-0.02	90.5	310.0	82.8	83.4
134			0.134	0.00	71.8	0.55	-	2.05	-0.02	90.1	308.8	82.8	83.6
135			0.136	0.00	71.8	0.56	-	2.04	0.00	89.4	307.6	82.7	83.7
136			0.134	0.00	71.7	0.55	-	2.02	-0.02	89.1	306.2	82.6	84.3
137			0.135	0.00	71.7	0.54	-	2.00	-0.02	89.1	305.6	82.7	84.0
138			0.134	0.00	71.6	0.55	-	1.98	-0.02	89.0	304.4	82.7	84.3
139			0.135	0.00	71.6	0.54	-	1.96	-0.02	89.0	303.8	82.6	84.6
140	23.799	0.174	0.133	0.00	71.7	0.55	101	1.94	-0.02	89.1	302.7	82.6	84.6
141			0.134	0.00	71.7	0.55	-	1.92	-0.02	88.9	302.4	82.5	84.7
142			0.135	0.00	71.6	0.55	-	1.91	-0.02	88.7	301.2	82.5	85.0
143			0.136	0.00	71.6	0.56	-	1.89	-0.02	88.8	300.8	82.5	85.0
144			0.133	0.00	71.7	0.54	-	1.86	-0.03	88.7	300.0	82.5	85.2
145			0.134	0.00	71.6	0.55	-	1.86	0.00	88.7	299.4	82.3	85.2
146			0.135	0.00	71.6	0.54	-	1.84	-0.02	88.6	298.6	82.5	85.3
147			0.134	0.00	71.6	0.54	-	1.81	-0.03	88.6	297.9	82.4	85.5
148			0.133	0.00	71.6	0.55	-	1.80	-0.02	88.5	297.2	82.4	85.0
149			0.134	0.00	71.6	0.55	-	1.78	-0.01	88.4	296.4	82.4	85.5
150	25.524	0.173	0.134	0.00	71.6	0.56	101	1.76	-0.02	88.4	296.1	82.4	85.5
151			0.133	0.00	71.6	0.55	-	1.74	-0.02	88.4	295.6	82.5	85.1
152			0.135	0.00	71.7	0.55	-	1.73	-0.01	88.3	295.6	82.6	85.8
153			0.135	0.00	71.7	0.57	-	1.71	-0.02	88.2	295.2	82.5	85.6
154			0.136	0.00	71.6	0.55	-	1.70	-0.01	88.1	294.6	82.4	85.6
155			0.134	0.00	71.7	0.56	-	1.67	-0.03	88.1	294.6	82.3	85.6
156			0.135	0.00	71.6	0.55	-	1.65	-0.02	88.0	293.8	82.2	85.0
157			0.135	0.00	71.6	0.56	-	1.63	-0.02	87.9	293.5	82.2	85.0
158			0.133	0.00	71.5	0.56	-	1.63	-0.01	88.0	293.6	82.4	86.1
159			0.133	0.00	71.6	0.56	-	1.62	-0.01	88.0	293.0	82.4	86.0
160	27.262	0.174	0.133	0.00	71.6	0.56	101	1.60	-0.02	88.0	292.4	82.5	85.9
161			0.133	0.00	71.7	0.56	-	1.57	-0.03	87.9	292.4	82.4	85.6
162			0.135	0.00	71.7	0.56	-	1.56	-0.02	87.7	291.4	82.6	85.5
163			0.134	0.00	71.7	0.56	-	1.55	-0.01	87.7	290.8	82.7	85.5
164			0.135	0.00	71.8	0.56	-	1.53	-0.01	87.7	290.6	82.6	85.1

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165			0.133	0.00	71.7	0.54	-	1.51	-0.03	87.7	290.2	82.6	85.3
166			0.135	0.00	71.6	0.55	-	1.49	-0.02	87.6	289.4	82.5	85.7
167			0.136	0.00	71.6	0.55	-	1.49	0.00	87.6	289.3	82.5	85.3
168			0.137	0.00	71.5	0.55	-	1.48	-0.01	87.5	288.7	82.5	85.5
169			0.136	0.00	71.5	0.56	-	1.45	-0.02	87.4	288.3	82.4	85.4
170	28.994	0.173	0.136	0.00	71.5	0.56	100	1.44	-0.01	87.4	287.6	82.4	85.1
171			0.136	0.00	71.5	0.56	-	1.43	-0.01	87.3	287.3	82.5	85.4
172			0.135	0.00	71.5	0.56	-	1.41	-0.02	87.3	286.4	82.4	85.4
173			0.135	0.00	71.5	0.57	-	1.40	-0.01	87.2	285.8	82.5	85.1
174			0.137	0.00	71.5	0.55	-	1.38	-0.02	87.1	285.2	82.5	85.1
175			0.136	0.00	71.5	0.56	-	1.37	-0.01	87.0	284.6	82.4	85.3
176			0.136	0.00	71.4	0.55	-	1.35	-0.02	87.0	284.3	82.4	85.6
177			0.136	0.00	71.4	0.56	-	1.34	-0.02	87.0	284.1	82.3	85.5
178			0.135	0.00	71.4	0.56	-	1.32	-0.02	87.0	284.1	82.2	85.2
179			0.135	0.00	71.4	0.55	-	1.31	-0.01	87.0	283.9	82.2	85.3
180	30.729	0.174	0.133	0.00	71.5	0.55	101	1.28	-0.02	87.0	283.4	82.3	85.5
181			0.135	0.00	71.5	0.57	-	1.27	-0.01	87.0	283.5	82.2	85.2
182			0.135	0.00	71.5	0.56	-	1.26	-0.01	86.9	283.4	82.2	84.5
183			0.134	0.00	71.4	0.57	-	1.25	-0.01	86.9	283.6	82.1	84.8
184			0.135	0.00	71.4	0.56	-	1.22	-0.03	86.8	283.3	82.2	85.2
185			0.135	0.00	71.4	0.57	-	1.21	-0.01	86.7	282.8	82.2	85.3
186			0.135	0.00	71.3	0.56	-	1.20	-0.01	86.8	282.5	82.2	85.2
187			0.136	0.00	71.3	0.56	-	1.19	-0.01	86.9	282.3	82.2	84.9
188			0.135	0.00	71.3	0.55	-	1.18	-0.01	86.7	282.4	82.1	85.0
189			0.136	0.00	71.3	0.54	-	1.16	-0.02	86.7	282.2	81.9	85.0
190	32.467	0.174	0.135	0.00	71.4	0.55	101	1.14	-0.02	86.6	282.2	82.2	85.3
191			0.133	0.00	71.4	0.55	-	1.12	-0.02	86.6	281.9	83.1	85.1
192			0.134	0.00	71.5	0.55	-	1.11	-0.01	86.7	281.9	84.3	85.3
193			0.135	0.00	71.5	0.56	-	1.09	-0.02	86.6	281.7	85.1	84.7
194			0.135	0.00	71.5	0.56	-	1.08	-0.02	86.6	281.5	85.9	85.0
195			0.133	0.00	71.5	0.56	-	1.06	-0.01	86.5	281.3	86.4	84.9
196			0.136	0.00	71.5	0.57	-	1.04	-0.02	86.5	281.1	86.9	85.3
197			0.135	0.00	71.4	0.57	-	1.03	-0.01	86.5	281.4	87.4	85.0



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198			0.135	0.00	71.5	0.57	-	1.01	-0.02	86.4	281.4	87.9	85.0
199			0.135	0.00	71.5	0.56	-	0.99	-0.02	86.4	281.2	88.3	85.0
200	34.189	0.172	0.135	0.00	71.5	0.56	99	0.98	-0.01	86.4	281.2	87.9	85.0
201			0.134	0.00	71.6	0.56	-	0.96	-0.02	86.4	280.9	87.1	85.0
202			0.136	0.00	71.6	0.57	-	0.94	-0.02	86.4	280.8	86.4	85.3
203			0.136	0.00	71.6	0.57	-	0.94	-0.02	86.3	280.4	85.8	85.2
204			0.136	0.00	71.5	0.56	-	0.92	-0.02	86.3	280.2	85.2	85.2
205			0.135	0.00	71.5	0.56	-	0.91	-0.01	86.2	280.4	84.7	85.2
206			0.135	0.00	71.5	0.56	-	0.89	-0.02	86.3	280.0	84.3	84.5
207			0.136	0.00	71.5	0.57	-	0.88	-0.01	86.2	279.9	83.9	85.1
208			0.136	0.00	71.5	0.56	-	0.86	-0.02	86.1	279.4	83.5	84.8
209			0.134	0.00	71.6	0.58	-	0.85	-0.01	86.1	279.3	83.2	85.0
210	35.914	0.172	0.133	0.00	71.6	0.56	100	0.82	-0.03	86.1	279.1	82.6	84.9
211			0.135	0.00	71.6	0.57	-	0.81	-0.01	86.1	278.3	82.4	84.8
212			0.135	0.00	71.5	0.57	-	0.80	-0.01	85.9	276.2	81.9	84.6
213			0.135	0.00	71.5	0.56	-	0.79	-0.01	85.8	274.6	81.8	85.0
214			0.136	0.00	71.6	0.58	-	0.78	-0.01	85.7	273.3	81.5	85.0
215			0.135	0.00	71.5	0.55	-	0.76	-0.02	85.8	272.2	81.2	85.0
216			0.137	0.00	71.6	0.56	-	0.75	-0.01	85.6	271.2	80.9	84.5
217			0.135	0.00	71.5	0.57	-	0.73	-0.02	85.6	270.6	81.4	84.8
218			0.135	0.00	71.5	0.57	-	0.72	-0.01	85.5	269.6	82.3	84.6
219			0.135	0.00	71.6	0.56	-	0.71	-0.01	85.5	268.6	83.2	84.7
220	37.657	0.174	0.134	0.00	71.6	0.57	101	0.69	-0.02	85.4	267.9	84.1	84.7
221			0.135	0.00	71.7	0.57	-	0.68	-0.01	85.3	266.8	84.8	84.8
222			0.135	0.00	71.8	0.56	-	0.67	-0.01	85.4	266.5	85.4	85.1
223			0.137	0.00	71.8	0.56	-	0.66	-0.02	85.3	266.1	86.0	85.2
224			0.136	0.00	71.8	0.56	-	0.64	-0.02	85.2	265.6	86.6	84.7
225			0.136	0.00	71.8	0.57	-	0.62	-0.01	85.2	265.3	87.0	84.8
226			0.136	0.00	71.8	0.57	-	0.61	-0.01	85.1	265.0	87.0	84.8
227			0.137	0.00	71.7	0.57	-	0.60	-0.02	85.0	264.7	86.9	85.1
228			0.136	0.00	71.8	0.57	-	0.59	-0.01	85.1	264.2	86.5	84.7
229			0.136	0.00	71.7	0.57	-	0.58	-0.01	85.1	263.9	86.4	84.6
230	39.393	0.174	0.137	0.00	71.7	0.57	100	0.56	-0.02	84.6	263.4	86.1	85.0

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231			0.136	0.00	71.7	0.56	-	0.54	-0.01	84.5	263.2	85.9	85.0
232			0.136	0.00	71.7	0.57	-	0.53	-0.02	84.4	262.7	85.7	85.5
233			0.136	0.00	71.7	0.57	-	0.52	-0.01	84.2	262.0	85.4	85.2
234			0.137	0.00	71.7	0.56	-	0.50	-0.01	84.3	261.8	85.5	85.2
235			0.137	0.00	71.7	0.57	-	0.49	-0.01	84.2	261.7	85.3	85.3
236			0.136	0.00	71.7	0.55	-	0.47	-0.02	84.2	260.7	85.1	84.9
237			0.136	0.00	71.7	0.56	-	0.47	-0.01	84.1	260.4	85.3	85.2
238			0.136	0.00	71.6	0.57	-	0.45	-0.02	84.1	259.7	85.0	85.1
239			0.134	0.00	71.7	0.56	-	0.44	-0.01	84.0	259.1	85.0	84.9
240	41.126	0.173	0.135	0.00	71.6	0.57	99	0.42	-0.02	84.1	258.4	85.0	85.2
241			0.135	0.00	71.7	0.56	-	0.40	-0.01	84.0	257.6	85.2	84.8
242			0.135	0.00	71.7	0.58	-	0.40	0.00	84.0	256.6	85.1	85.2
243			0.136	0.00	71.7	0.56	-	0.39	-0.01	84.0	256.2	85.0	85.0
244			0.138	0.00	71.6	0.58	-	0.37	-0.01	83.8	255.7	84.9	85.2
245			0.136	0.00	71.6	0.57	-	0.36	-0.01	83.8	254.9	84.9	84.9
246			0.136	0.00	71.6	0.58	-	0.35	-0.01	83.7	254.0	85.0	85.2
247			0.136	0.00	71.6	0.56	-	0.34	-0.01	83.7	253.3	84.9	85.0
248			0.137	0.00	71.6	0.57	-	0.33	-0.02	83.6	252.5	84.8	85.1
249			0.137	0.00	71.5	0.56	-	0.31	-0.01	83.7	251.7	84.7	85.0
250	42.855	0.173	0.136	0.00	71.5	0.57	99	0.29	-0.02	83.6	250.8	84.6	84.6
251			0.136	0.00	71.6	0.57	-	0.29	-0.01	83.6	250.3	84.7	84.9
252			0.137	0.00	71.5	0.58	-	0.27	-0.01	83.4	249.7	84.4	84.8
253			0.136	0.00	71.5	0.58	-	0.25	-0.02	83.5	249.0	84.3	84.7
254			0.135	0.00	71.5	0.56	-	0.25	0.00	83.4	248.5	84.3	85.0
255			0.136	0.00	71.4	0.58	-	0.24	-0.01	83.3	247.8	84.3	85.1
256			0.134	0.00	71.4	0.58	-	0.23	-0.01	83.3	246.8	84.2	85.0
257			0.136	0.00	71.4	0.57	-	0.22	-0.02	83.2	246.4	84.4	84.8
258			0.138	0.00	71.4	0.57	-	0.22	0.00	83.1	246.0	84.3	84.7
259			0.136	0.00	71.4	0.58	-	0.19	-0.02	83.1	245.5	84.3	84.7
260	44.592	0.174	0.137	0.00	71.3	0.57	100	0.19	-0.01	83.1	245.1	84.2	84.8
261			0.135	0.00	71.4	0.57	-	0.17	-0.02	83.0	244.7	84.2	84.4
262			0.137	0.00	71.4	0.56	-	0.17	0.00	83.0	244.3	84.1	84.7
263			0.136	0.00	71.4	0.57	-	0.16	-0.01	82.9	243.8	84.1	84.6

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264			0.137	0.00	71.4	0.56	-	0.13	-0.02	82.9	243.2	84.0	84.5
265			0.136	0.00	71.3	0.58	-	0.13	-0.01	82.9	242.6	84.0	84.0
266			0.136	0.00	71.3	0.57	-	0.10	-0.02	82.8	241.7	84.2	84.4
267			0.134	0.00	71.3	0.56	-	0.10	0.00	82.7	241.2	84.0	84.6
268			0.136	0.00	71.3	0.58	-	0.09	-0.02	82.7	240.3	84.1	84.4
269			0.135	0.00	71.3	0.57	-	0.09	0.00	82.7	239.5	83.9	84.2
270	46.317	0.173	0.136	0.00	71.3	0.57	99	0.07	-0.02	82.6	238.8	83.9	84.1
271			0.136	0.00	71.4	0.57	-	0.06	-0.01	82.4	238.0	83.9	84.4
272			0.134	0.00	71.4	0.57	-	0.04	-0.02	82.5	237.2	83.8	84.3
273			0.135	0.00	71.4	0.57	-	0.05	0.00	82.4	236.5	83.7	84.3
274			0.136	0.00	71.4	0.57	-	0.03	-0.01	82.3	235.9	83.7	84.1
275			0.136	0.00	71.5	0.57	-	0.02	-0.01	82.3	235.3	83.9	84.5
276			0.136	0.00	71.5	0.56	-	0.01	-0.02	82.3	234.5	83.6	84.2
277			0.137	0.00	71.4	0.57	-	0.01	0.00	82.2	234.1	83.8	84.2
278	47.537	0.174	0.137	0.00	71.4	0.57	100	0.00	-0.01	82.2	234.1	83.8	84.2
Avg/Tot	47.537	0.172	0.133	0.00	71.8	0.49	100			93.2	384.0	84.2	82.0

Data from 12/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	70.6	-0.27		85.6	-0.079	2.52	0.144	9.9	44.8
1			0.00	71.1	0.39	-	88.2	-0.071	1.89	0.077	12.3	49.1
2			0.00	71.2	0.49	-	86.3	-0.081	2.16	0.156	14.2	54.1
3			0.00	71.2	0.48	-	86.5	-0.095	3.19	0.164	14.7	58.6
4			0.00	71.2	0.45	-	87.0	-0.095	9.06	0.209	16.7	57.2
5			0.00	71.2	0.47	-	86.6	-0.096	12.59	0.191	19.6	57.2
6			0.00	71.3	0.47	-	86.2	-0.099	12.60	0.178	19.9	57.2
7			0.00	71.3	0.40	-	85.9	-0.096	12.39	0.175	19.8	55.9
8			0.00	71.4	0.49	-	85.6	-0.096	11.31	0.226	19.8	55.2
9			0.00	71.4	0.48	-	85.2	-0.098	11.62	0.185	19.8	55.2
10	1.719	0.172	0.00	71.4	0.49	106	84.9	-0.097	11.35	0.186	19.8	54.7
11			0.00	71.4	0.45	-	84.5	-0.098	11.63	0.171	21.1	53.8
12			0.00	71.4	0.50	-	84.0	-0.100	11.98	0.166	21.5	54.0
13			0.00	71.3	0.39	-	83.7	-0.099	12.80	0.230	21.9	54.0
14			0.00	71.3	0.49	-	83.4	-0.100	12.33	0.198	22.0	54.0
15			0.00	71.4	0.50	-	83.3	-0.099	12.12	0.231	22.0	53.8
16			0.00	71.4	0.43	-	83.1	-0.100	12.47	0.240	22.2	54.1
17			0.00	71.4	0.43	-	82.8	-0.099	13.02	0.291	22.4	54.3
18			0.00	71.4	0.49	-	82.7	-0.099	12.93	0.189	22.2	54.3
19			0.00	71.4	0.49	-	82.7	-0.100	13.28	0.198	21.6	55.8
20	3.416	0.170	0.00	71.4	0.43	104	83.0	-0.100	13.77	0.253	20.3	56.8
21			0.00	71.4	0.47	-	83.1	-0.100	14.24	0.276	19.7	57.2
22			0.00	71.4	0.50	-	83.0	-0.099	14.28	0.336	20.2	56.8
23			0.00	71.4	0.41	-	82.6	-0.101	14.41	0.270	20.7	56.1
24			0.00	71.4	0.48	-	82.6	-0.100	14.46	0.322	21.0	56.1
25			0.00	71.4	0.43	-	82.5	-0.102	14.82	0.371	21.2	56.1
26			0.00	71.5	0.46	-	82.4	-0.103	15.32	0.575	21.4	56.5
27			0.00	71.5	0.45	-	82.3	-0.105	15.79	0.628	21.4	56.8
28			0.00	71.5	0.46	-	82.4	-0.104	16.06	0.764	21.5	57.0
29			0.00	71.5	0.42	-	82.3	-0.107	16.52	0.779	21.4	57.6
30	5.116	0.170	0.00	71.4	0.49	104	82.3	-0.107	17.04	0.951	21.4	57.9
31			0.00	71.5	0.42	-	82.3	-0.107	16.84	1.055	21.2	58.1
32			0.00	71.4	0.53	-	82.4	-0.108	16.90	1.112	21.2	58.5
33			0.00	71.4	0.54	-	82.5	-0.108	16.72	1.206	21.1	58.5
34			0.00	71.4	0.54	-	82.4	-0.107	16.77	1.233	20.9	58.5
35			0.00	71.4	0.54	-	82.5	-0.107	16.83	1.253	20.9	58.3
36			0.00	71.4	0.53	-	82.4	-0.107	16.83	1.228	20.8	58.5
37			0.00	71.4	0.59	-	82.4	-0.108	16.88	1.164	20.7	58.5
38			0.00	71.3	0.62	-	82.4	-0.107	16.77	1.174	20.7	58.5

Data from 12/21/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	71.4	0.55	-	82.3	-0.108	16.80	1.120	20.6	58.5
40	6.809	0.169	0.00	71.4	0.64	104	82.3	-0.107	16.77	1.074	20.6	58.5
41			0.00	71.4	0.62	-	82.1	-0.107	16.71	1.164	20.5	58.3
42			0.00	71.4	0.57	-	82.3	-0.108	16.73	1.256	20.7	58.5
43			0.00	71.4	0.58	-	82.3	-0.108	16.80	1.263	20.6	58.3
44			0.00	71.4	0.59	-	82.3	-0.108	16.62	1.394	20.5	58.5
45			0.00	71.4	0.60	-	82.3	-0.108	16.68	1.430	20.4	58.3
46			0.00	71.3	0.65	-	82.5	-0.108	16.82	1.351	20.4	58.5
47			0.00	71.3	0.67	-	82.5	-0.108	16.80	1.375	20.4	58.5
48			0.00	71.3	0.67	-	82.5	-0.108	17.00	1.252	20.4	58.3
49			0.00	71.3	0.65	-	82.6	-0.109	17.19	1.306	20.4	58.5
50	8.486	0.168	0.00	71.3	0.67	104	82.6	-0.108	17.20	1.350	20.4	58.6
51			0.00	71.3	0.70	-	82.6	-0.108	17.45	1.601	20.4	58.8
52			0.00	71.3	0.71	-	82.7	-0.108	17.41	1.589	20.1	58.5
53			0.00	71.2	0.71	-	82.8	-0.108	17.36	1.533	20.1	58.6
54			0.00	71.3	0.70	-	82.9	-0.109	17.42	1.535	19.9	58.3
55			0.00	71.2	0.72	-	82.9	-0.109	17.52	1.380	19.8	58.1
56			0.00	71.2	0.71	-	82.9	-0.108	17.50	1.331	19.6	57.9
57			0.00	71.2	0.72	-	82.9	-0.108	17.67	1.220	19.5	57.7
58			0.00	71.2	0.73	-	82.9	-0.108	17.77	1.173	19.5	57.6
59			0.00	71.2	0.75	-	82.8	-0.108	17.63	1.114	19.3	57.4
60	10.165	0.168	0.00	71.3	0.74	104	82.8	-0.108	17.50	0.986	19.2	57.2
61			0.00	71.2	0.75	-	83.0	-0.107	17.44	0.829	19.1	56.7
62			0.00	71.3	0.79	-	82.9	-0.107	17.36	0.662	18.9	56.3
63			0.00	71.2	0.79	-	82.8	-0.106	17.01	0.722	18.9	55.9
64			0.00	71.3	0.75	-	82.7	-0.106	16.82	0.438	18.8	55.4
65			0.00	71.3	0.77	-	82.6	-0.103	15.63	0.411	18.4	54.3
66			0.00	71.3	0.76	-	82.6	-0.102	14.87	0.298	18.2	53.6
67			0.00	71.3	0.76	-	82.7	-0.102	14.66	0.226	18.3	53.1
68			0.00	71.4	0.81	-	82.6	-0.101	14.04	0.195	18.2	52.3
69			0.00	71.3	0.76	-	82.4	-0.100	13.69	0.108	18.0	51.6
70	11.841	0.168	0.00	71.4	0.76	103	82.4	-0.098	13.44	0.069	17.9	50.9
71			0.00	71.4	0.84	-	82.4	-0.097	13.03	0.038	17.7	50.4
72			0.00	71.4	0.79	-	82.4	-0.097	12.68	0.022	17.7	49.5
73			0.00	71.3	0.85	-	82.1	-0.095	11.99	0.000	17.7	48.7
74			0.00	71.3	0.77	-	81.9	-0.093	11.19	0.000	17.2	47.8
75			0.00	71.3	0.80	-	82.0	-0.093	11.04	0.000	17.1	47.5
76			0.00	71.3	0.82	-	82.0	-0.091	10.90	0.000	17.1	46.9
77			0.00	71.3	0.83	-	82.2	-0.091	10.45	0.000	16.9	46.4

Data from 12/21/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	71.3	0.83	-	82.4	-0.090	9.93	0.000	16.8	45.9
79			0.00	71.3	0.79	-	82.4	-0.090	9.83	0.000	16.7	45.5
80	13.544	0.170	0.00	71.3	0.85	103	82.6	-0.089	9.77	0.000	16.7	45.1
81			0.00	71.3	0.85	-	82.8	-0.088	9.66	0.000	16.7	44.8
82			0.00	71.2	0.84	-	82.9	-0.087	9.59	0.000	16.6	44.2
83			0.00	71.2	0.80	-	83.1	-0.087	9.53	0.000	16.6	43.9
84			0.00	71.2	0.86	-	83.2	-0.086	9.46	0.000	16.5	43.5
85			0.00	71.2	0.80	-	83.3	-0.086	9.37	0.000	16.5	43.2
86			0.00	71.2	0.84	-	83.4	-0.085	9.26	0.000	16.5	43.0
87			0.00	71.2	0.82	-	83.6	-0.085	9.15	0.014	16.5	42.6
88			0.00	71.3	0.83	-	83.6	-0.084	8.98	0.031	16.5	42.3
89			0.00	71.3	0.82	-	83.7	-0.082	8.50	0.024	16.5	42.1
90	15.253	0.171	0.00	71.3	0.86	103	83.7	-0.082	8.10	0.038	16.5	41.9
91			0.00	71.3	0.85	-	83.6	-0.081	7.81	0.104	16.4	41.5
92			0.00	71.3	0.78	-	83.4	-0.080	7.56	0.172	16.5	41.2
93			0.00	71.3	0.79	-	83.4	-0.080	7.29	0.291	16.7	41.0
94			0.00	71.3	0.85	-	83.4	-0.078	7.22	0.279	16.7	40.8
95			0.00	71.3	0.77	-	83.5	-0.078	7.09	0.348	16.7	40.8
96			0.00	71.4	0.82	-	83.7	-0.076	6.94	0.419	16.2	41.0
97			0.00	71.3	0.76	-	83.8	-0.075	6.81	0.446	16.0	40.8
98			0.00	71.4	0.84	-	83.9	-0.074	7.04	0.385	15.9	41.0
99			0.00	71.4	0.78	-	84.1	-0.075	6.63	0.506	15.8	40.8
100	16.955	0.170	0.00	71.4	0.78	102	84.3	-0.074	6.53	0.484	15.7	40.6
101			0.00	71.4	0.82	-	84.3	-0.074	6.51	0.460	15.6	40.5
102			0.00	71.5	0.83	-	84.4	-0.072	6.18	0.632	15.4	40.1
103			0.00	71.5	0.81	-	84.4	-0.072	6.14	0.685	15.5	40.1
104			0.00	71.5	0.82	-	84.4	-0.071	6.10	0.695	15.6	40.1
105			0.00	71.5	0.87	-	84.4	-0.071	6.09	0.719	15.6	40.1
106			0.00	71.5	0.81	-	84.3	-0.070	6.14	0.760	15.6	40.1
107			0.00	71.5	0.84	-	84.3	-0.069	6.15	0.789	15.7	39.9
108			0.00	71.6	0.82	-	84.4	-0.069	6.06	0.735	15.7	39.7
109			0.00	71.6	0.86	-	84.4	-0.069	6.04	0.685	15.6	39.6
110	18.677	0.172	0.00	71.6	0.81	103	84.5	-0.068	6.05	0.657	15.6	39.4
111			0.00	71.5	0.84	-	84.4	-0.068	6.18	0.596	15.7	39.4
112			0.00	71.5	0.84	-	84.5	-0.067	6.20	0.633	15.7	39.4
113			0.00	71.5	0.78	-	84.5	-0.068	6.24	0.632	15.7	39.2
114			0.00	71.5	0.85	-	84.6	-0.067	6.17	0.632	15.7	39.2
115			0.00	71.5	0.82	-	84.5	-0.067	6.23	0.605	15.7	39.0
116			0.00	71.5	0.79	-	84.5	-0.066	6.11	0.568	15.7	38.8

Data from 12/21/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.00	71.5	0.84	-	84.5	-0.066	6.07	0.577	15.7	38.7
118			0.00	71.5	0.78	-	84.6	-0.066	6.08	0.520	15.7	38.7
119			0.00	71.5	0.81	-	84.6	-0.066	6.04	0.502	15.7	38.5
120	20.394	0.172	0.00	71.5	0.84	103	84.6	-0.065	5.96	0.494	15.7	38.5
121			0.00	71.5	0.81	-	84.6	-0.065	5.93	0.480	15.8	38.5
122			0.00	71.5	0.79	-	84.5	-0.065	5.92	0.481	15.8	38.3
123			0.00	71.5	0.82	-	84.5	-0.065	5.81	0.482	15.8	38.3
124			0.00	71.4	0.79	-	84.5	-0.064	5.80	0.472	15.9	38.3
125			0.00	71.4	0.80	-	84.5	-0.065	5.81	0.472	15.9	38.1
126			0.00	71.4	0.82	-	84.6	-0.064	5.78	0.467	15.9	38.1
127			0.00	71.4	0.81	-	84.6	-0.064	5.83	0.468	16.0	38.1
128			0.00	71.4	0.85	-	84.5	-0.063	5.77	0.463	16.0	38.1
129			0.00	71.4	0.80	-	84.4	-0.063	5.72	0.458	16.0	38.1
130	22.121	0.173	0.00	71.4	0.86	103	84.4	-0.063	5.70	0.456	16.1	38.1
131			0.00	71.4	0.85	-	84.3	-0.063	5.58	0.445	16.1	37.9
132			0.00	71.3	0.87	-	84.3	-0.063	5.60	0.437	16.2	37.9
133			0.00	71.3	0.81	-	84.1	-0.062	5.59	0.430	16.3	38.1
134			0.00	71.3	0.81	-	84.1	-0.062	5.56	0.426	16.3	37.9
135			0.00	71.2	0.80	-	84.0	-0.062	5.60	0.423	16.6	37.8
136			0.00	71.3	0.80	-	83.9	-0.062	5.64	0.424	16.7	37.8
137			0.00	71.2	0.84	-	83.9	-0.062	5.47	0.446	16.7	37.6
138			0.00	71.3	0.83	-	83.9	-0.062	5.51	0.444	16.7	37.6
139			0.00	71.2	0.80	-	83.9	-0.062	5.53	0.432	16.7	37.6
140	23.857	0.174	0.00	71.2	0.83	103	83.8	-0.062	5.52	0.420	16.7	37.6
141			0.00	71.2	0.83	-	83.8	-0.061	5.49	0.410	16.8	37.6
142			0.00	71.2	0.81	-	83.8	-0.062	5.49	0.406	16.8	37.4
143			0.00	71.2	0.80	-	83.8	-0.061	5.48	0.403	16.8	37.6
144			0.00	71.2	0.81	-	83.8	-0.061	5.49	0.395	16.9	37.6
145			0.00	71.2	0.84	-	83.8	-0.061	5.47	0.393	16.9	37.6
146			0.00	71.2	0.85	-	83.8	-0.061	5.50	0.398	16.9	37.6
147			0.00	71.2	0.78	-	83.6	-0.060	5.44	0.392	16.9	37.6
148			0.00	71.2	0.82	-	83.7	-0.061	5.50	0.414	17.0	37.6
149			0.00	71.2	0.79	-	83.7	-0.061	5.54	0.412	17.0	37.6
150	25.595	0.174	0.00	71.2	0.82	104	83.8	-0.061	5.52	0.403	17.0	37.4
151			0.00	71.2	0.86	-	83.8	-0.060	5.53	0.399	17.0	37.4
152			0.00	71.2	0.85	-	83.5	-0.060	5.57	0.400	17.0	37.4
153			0.00	71.1	0.80	-	83.4	-0.060	5.54	0.394	17.1	37.6
154			0.00	71.1	0.86	-	83.3	-0.060	5.51	0.390	17.4	37.8
155			0.00	71.0	0.82	-	83.3	-0.060	5.55	0.386	17.3	37.8

Data from 12/21/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
156			0.00	71.0	0.79	-	83.3	-0.060	5.46	0.375	17.3	37.8
157			0.00	71.0	0.85	-	83.2	-0.060	5.50	0.374	17.3	37.6
158			0.00	71.0	0.84	-	83.3	-0.060	5.45	0.372	17.3	37.6
159			0.00	71.0	0.80	-	83.3	-0.060	5.45	0.372	17.2	37.6
160	27.329	0.173	0.00	71.0	0.82	103	83.0	-0.060	5.44	0.367	17.3	37.6
161			0.00	71.1	0.86	-	82.9	-0.060	5.51	0.365	17.3	37.6
162			0.00	71.1	0.79	-	82.8	-0.059	5.31	0.368	17.3	37.4
163			0.00	71.1	0.81	-	82.8	-0.059	5.31	0.369	17.3	37.4
164			0.00	71.1	0.83	-	82.7	-0.060	5.30	0.368	17.4	37.4
165			0.00	71.1	0.82	-	82.6	-0.060	5.31	0.365	17.3	37.4
166			0.00	71.0	0.81	-	82.5	-0.059	5.31	0.364	17.4	37.4
167			0.00	70.9	0.81	-	82.5	-0.059	5.32	0.364	17.4	37.4
168			0.00	70.9	0.79	-	82.8	-0.059	5.00	0.366	17.4	37.4
169			0.00	70.8	0.80	-	82.8	-0.059	4.99	0.368	17.4	37.4
170	29.062	0.173	0.00	70.8	0.82	103	82.8	-0.059	4.97	0.360	17.4	37.4
171			0.00	70.9	0.86	-	82.8	-0.059	4.96	0.360	17.5	37.4
172			0.00	70.9	0.79	-	82.7	-0.059	4.94	0.353	17.5	37.4
173			0.00	70.9	0.79	-	82.7	-0.059	4.98	0.353	17.5	37.2
174			0.00	70.8	0.78	-	82.7	-0.059	4.99	0.353	17.6	37.2
175			0.00	70.8	0.85	-	82.7	-0.059	5.01	0.351	17.6	37.2
176			0.00	70.7	0.80	-	82.7	-0.058	5.04	0.349	17.6	37.2
177			0.00	70.7	0.85	-	82.6	-0.059	5.06	0.349	17.6	37.2
178			0.00	70.7	0.83	-	82.5	-0.059	5.08	0.347	17.6	37.2
179			0.00	70.8	0.80	-	82.6	-0.058	5.08	0.347	17.6	37.2
180	30.806	0.174	0.00	70.9	0.80	103	82.8	-0.059	5.10	0.345	17.5	37.2
181			0.00	70.9	0.84	-	82.9	-0.058	5.12	0.346	17.5	37.0
182			0.00	70.9	0.86	-	82.8	-0.058	5.14	0.347	17.5	37.0
183			0.00	70.8	0.86	-	82.7	-0.059	5.13	0.344	17.5	37.0
184			0.00	70.8	0.80	-	82.7	-0.058	5.21	0.348	17.6	37.0
185			0.00	70.8	0.85	-	82.6	-0.058	4.88	0.363	17.6	37.0
186			0.00	70.8	0.88	-	82.6	-0.057	4.97	0.354	17.6	37.0
187			0.00	70.7	0.86	-	82.6	-0.059	5.04	0.354	17.5	37.0
188			0.00	70.7	0.83	-	82.6	-0.058	5.00	0.350	17.6	37.0
189			0.00	70.8	0.81	-	82.6	-0.058	5.01	0.347	17.6	37.0
190	32.539	0.173	0.00	70.8	0.84	103	82.8	-0.058	5.02	0.343	17.7	37.0
191			0.00	70.8	0.86	-	83.0	-0.058	5.06	0.345	17.7	37.0
192			0.00	70.9	0.80	-	83.3	-0.058	5.09	0.343	17.6	37.0
193			0.00	70.9	0.87	-	83.5	-0.057	5.06	0.349	17.7	37.0
194			0.00	70.9	0.81	-	83.7	-0.058	5.02	0.343	17.7	37.0

Data from 12/21/2022 testing - Reference only



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
195			0.00	70.9	0.86	-	84.1	-0.058	5.02	0.345	17.7	36.9
196			0.00	70.9	0.82	-	84.3	-0.058	4.99	0.340	17.7	36.9
197			0.00	70.9	0.86	-	84.7	-0.058	4.84	0.368	17.7	36.9
198			0.00	70.9	0.80	-	84.8	-0.058	4.84	0.362	17.7	36.9
199			0.00	70.9	0.83	-	85.0	-0.058	4.88	0.359	17.7	36.9
200	34.276	0.174	0.00	70.9	0.82	103	85.2	-0.058	4.85	0.355	17.7	36.9
201			0.00	70.9	0.82	-	85.4	-0.058	4.85	0.356	17.7	36.9
202			0.00	70.9	0.84	-	85.5	-0.058	4.88	0.361	17.7	37.0
203			0.00	70.9	0.87	-	85.5	-0.058	4.89	0.364	17.8	37.0
204			0.00	70.9	0.82	-	85.6	-0.058	4.84	0.363	17.8	37.0
205			0.00	70.8	0.87	-	85.7	-0.058	4.82	0.359	17.9	37.0
206			0.00	70.9	0.85	-	85.8	-0.058	4.75	0.354	17.9	37.0
207			0.00	70.9	0.83	-	85.8	-0.057	4.75	0.359	17.9	37.0
208			0.00	70.9	0.88	-	85.9	-0.057	4.77	0.360	17.9	36.9
209			0.00	70.9	0.81	-	85.9	-0.058	4.78	0.358	17.9	36.9
210	36.004	0.173	0.00	70.9	0.88	102	85.9	-0.057	4.75	0.360	17.9	36.9
211			0.00	71.0	0.84	-	86.2	-0.057	4.63	0.361	17.9	36.9
212			0.00	70.9	0.81	-	86.2	-0.057	4.25	0.360	17.9	36.9
213			0.00	70.9	0.81	-	86.3	-0.057	4.22	0.354	17.9	36.7
214			0.00	70.9	0.84	-	86.2	-0.057	4.22	0.351	18.0	36.9
215			0.00	70.9	0.88	-	86.3	-0.056	4.21	0.349	18.0	36.9
216			0.00	70.9	0.82	-	86.4	-0.056	4.21	0.348	18.0	36.7
217			0.00	70.9	0.83	-	86.2	-0.056	4.18	0.347	18.0	36.7
218			0.00	70.9	0.87	-	86.0	-0.056	4.17	0.346	18.1	36.7
219			0.00	70.9	0.82	-	85.7	-0.055	4.20	0.349	18.1	36.7
220	37.752	0.175	0.00	71.0	0.85	104	85.5	-0.056	4.20	0.349	18.1	36.7
221			0.00	71.0	0.86	-	85.2	-0.055	4.18	0.348	18.1	36.7
222			0.00	71.0	0.89	-	85.2	-0.055	4.17	0.353	18.1	36.7
223			0.00	71.1	0.88	-	85.1	-0.055	4.17	0.354	18.2	36.7
224			0.00	71.1	0.87	-	85.0	-0.055	4.21	0.360	18.2	36.7
225			0.00	71.1	0.89	-	84.9	-0.055	4.21	0.360	18.2	36.7
226			0.00	71.1	0.86	-	84.9	-0.055	4.21	0.357	18.2	36.7
227			0.00	71.1	0.87	-	84.9	-0.055	4.22	0.360	18.2	36.5
228			0.00	71.0	0.83	-	84.9	-0.055	4.21	0.357	18.3	36.5
229			0.00	71.1	0.81	-	85.0	-0.055	4.19	0.353	18.2	36.5
230	39.496	0.174	0.00	71.1	0.82	103	85.0	-0.055	4.21	0.357	18.4	36.5
231			0.00	71.1	0.87	-	85.0	-0.054	4.22	0.355	18.4	36.3
232			0.00	71.1	0.81	-	85.0	-0.055	4.22	0.354	18.5	36.3
233			0.00	71.1	0.88	-	85.0	-0.054	4.24	0.358	18.5	36.3

Data from 12/21/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
234			0.00	71.1	0.88	-	85.0	-0.054	4.23	0.357	18.5	36.3
235			0.00	71.1	0.85	-	85.0	-0.054	4.23	0.356	18.5	36.3
236			0.00	71.1	0.86	-	85.0	-0.054	3.93	0.358	18.5	36.3
237			0.00	71.1	0.80	-	84.9	-0.054	3.94	0.351	18.5	36.3
238			0.00	71.0	0.81	-	84.9	-0.054	3.99	0.352	18.6	36.3
239			0.00	71.0	0.87	-	84.9	-0.054	3.88	0.344	18.6	36.3
240	41.237	0.174	0.00	71.0	0.88	102	84.8	-0.054	3.86	0.343	18.6	36.1
241			0.00	71.0	0.86	-	84.7	-0.054	3.82	0.340	18.6	36.3
242			0.00	71.0	0.85	-	84.6	-0.054	3.79	0.338	18.6	36.1
243			0.00	71.0	0.83	-	84.5	-0.054	3.78	0.337	18.6	36.1
244			0.00	71.0	0.83	-	84.5	-0.053	3.77	0.337	18.7	36.1
245			0.00	70.9	0.85	-	84.5	-0.054	3.75	0.338	18.7	36.1
246			0.00	70.9	0.86	-	84.7	-0.053	3.72	0.336	18.7	36.1
247			0.00	70.9	0.87	-	84.7	-0.053	3.63	0.326	18.7	36.1
248			0.00	71.0	0.83	-	84.6	-0.053	3.57	0.321	18.7	36.1
249			0.00	70.9	0.81	-	84.7	-0.053	3.55	0.319	18.7	36.1
250	42.985	0.175	0.00	70.9	0.84	103	84.7	-0.053	3.55	0.324	18.7	36.1
251			0.00	70.9	0.8	-	84.8	-0.052	3.54	0.319	18.7	36.1
252			0.00	70.9	0.87	-	84.9	-0.051	3.52	0.323	18.8	36.0
253			0.00	70.9	0.81	-	84.9	-0.052	3.55	0.330	18.8	36.0
254			0.00	70.9	0.80	-	84.9	-0.052	3.50	0.325	18.8	36.0
255			0.00	70.9	0.88	-	84.8	-0.052	3.45	0.321	18.9	36.0
256			0.00	70.9	0.89	-	84.6	-0.051	3.46	0.323	18.8	36.0
257			0.00	70.8	0.85	-	84.6	-0.051	3.44	0.324	18.9	36.0
258			0.00	70.8	0.87	-	84.6	-0.052	3.46	0.331	18.9	36.0
259			0.00	70.8	0.86	-	84.6	-0.051	3.49	0.341	19.0	36.0
260	44.724	0.174	0.00	70.8	0.84	102	84.5	-0.052	3.42	0.325	19.0	36.0
261			0.00	70.8	0.80	-	84.6	-0.051	3.42	0.323	19.0	36.0
262			0.00	70.8	0.85	-	84.7	-0.051	3.40	0.322	19.0	36.0
263			0.00	70.8	0.85	-	84.7	-0.051	3.39	0.324	19.0	36.0
264			0.00	70.8	0.84	-	84.8	-0.051	3.35	0.322	19.0	36.0
265			0.00	70.9	0.82	-	84.8	-0.050	3.33	0.322	19.0	36.0
266			0.00	70.8	0.87	-	84.8	-0.050	3.31	0.324	19.1	35.8
267			0.00	70.8	0.83	-	84.7	-0.051	3.28	0.321	19.1	35.8
268			0.00	70.8	0.81	-	84.7	-0.050	3.27	0.324	19.1	35.8
269			0.00	70.8	0.79	-	84.7	-0.050	3.20	0.336	19.1	35.8
270	46.450	0.173	0.00	70.8	0.85	101	84.7	-0.050	3.18	0.331	19.1	35.8
271			0.00	70.8	0.84	-	84.6	-0.050	3.18	0.332	19.2	35.8
272			0.00	70.8	0.80	-	84.6	-0.050	3.19	0.337	19.2	35.8

Data from 12/21/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
273			0.00	70.8	0.86	-	84.5	-0.049	3.18	0.335	19.2	35.8
274			0.00	70.7	0.83	-	84.6	-0.049	3.16	0.334	19.2	35.8
275			0.00	70.8	0.82	-	84.6	-0.049	3.15	0.335	19.3	35.8
276			0.00	70.8	0.88	-	84.6	-0.049	3.17	0.342	19.3	35.8
277			0.00	70.8	0.89	-	84.7	-0.049	3.14	0.335	19.3	35.8
278			0.00	70.8	0.82	100	84.7	-0.049	3.14	0.335	19.3	35.8
Avg/Tot	46.450	0.172	0.00	71.1	0.76	103	83.9	-0.072	7.75	0.450	18.04	42.777

Data from 12/2022 testing - Reference only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	70.2	0.00		82.6
1			0.00	70.3	0.00	-	82.7
2			0.00	70.3	0.00	-	83.9
3			0.00	70.3	0.00	-	84.7
4			0.00	70.3	0.00	-	85.3
5			0.00	70.3	0.00	-	84.7
6			0.00	70.2	0.00	-	84.4
7			0.00	70.2	0.00	-	84.3
8			0.00	70.2	0.00	-	84.3
9			0.00	70.2	0.00	-	84.2
10	2.134	0.213	0.00	70.2	0.00	106	84.3
11			0.00	70.2	0.00	-	84.1
12			0.00	70.2	0.00	-	84.0
13			0.00	70.2	0.00	-	83.8
14			0.00	70.2	0.00	-	83.7
15			0.00	70.2	0.00	-	83.6
16			0.00	70.2	0.00	-	83.5
17			0.00	70.2	0.00	-	83.3
18			0.00	70.2	0.00	-	83.1
19			0.00	70.2	0.00	-	83.0
20	4.252	0.212	0.00	70.2	0.00	104	82.8
21			0.00	70.2	0.00	-	82.9
22			0.00	70.2	0.00	-	82.8
23			0.00	70.1	0.00	-	82.7
24			0.00	70.2	0.00	-	82.7
25			0.00	70.2	0.00	-	82.6
26			0.00	70.2	0.00	-	82.5
27			0.00	70.2	0.00	-	82.5
28			0.00	70.2	0.00	-	82.4
29			0.00	70.1	0.00	-	82.4
30	6.359	0.211	0.00	70.1	0.00	104	82.4
31			0.00	70.2	0.00	-	82.4

Data from 12/2022 testing - Reference only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	70.1	0.00	-	82.4
33			0.00	70.1	0.00	-	82.4
34			0.00	70.1	0.00	-	82.3
35			0.00	70.1	0.00	-	82.3
36			0.00	70.1	0.00	-	82.3
37			0.00	70.1	0.00	-	82.3
38			0.00	70.2	0.00	-	82.3
39			0.00	70.2	0.00	-	82.4
40	8.397	0.204	0.00	70.1	0.00	101	82.4
41			0.00	70.2	0.00	-	82.4
42			0.00	70.2	0.00	-	82.4
43			0.00	70.1	0.00	-	82.4
44			0.00	70.2	0.00	-	82.4
45			0.00	70.1	0.00	-	82.4
46			0.00	70.2	0.00	-	82.4
47			0.00	70.2	0.00	-	82.4
48			0.00	70.2	0.00	-	82.4
49			0.00	70.2	0.00	-	82.5
50	10.461	0.206	0.00	70.2	0.00	103	82.5
51			0.00	70.1	0.00	-	82.5
52			0.00	70.2	0.00	-	82.6
53			0.00	70.2	0.00	-	82.5
54			0.00	70.2	0.00	-	82.5
55			0.00	70.1	0.00	-	82.5
56			0.00	70.2	0.00	-	82.6
57			0.00	70.2	0.00	-	82.5
58			0.00	70.1	0.00	-	82.5
59			0.00	70.1	0.00	-	82.5
60	12.453	0.199	0.00	70.2	0.00	99	82.5
Avg/Tot	12.453	0.208	0.00	70.2	0.00	103	82.9

Data from 12/2022 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	561.3	449.8	526.8	414.0	419.2	474.2	0
1	534.2	450.9	524.0	413.1	418.4	468.1	0
2	506.7	452.9	520.4	411.1	417.5	461.7	0
3	493.0	454.5	514.2	410.6	417.1	457.9	0
4	508.6	455.1	506.6	409.3	415.9	459.1	0
5	538.9	454.0	496.5	407.6	414.1	462.2	0
6	567.5	452.5	485.6	405.1	412.2	464.6	0
7	587.5	450.6	474.9	402.5	409.9	465.1	0
8	599.4	448.2	464.8	399.8	407.5	463.9	0
9	608.9	445.5	455.3	397.3	404.6	462.3	0
10	617.4	442.9	446.7	394.4	402.2	460.7	0
11	624.9	440.3	438.6	392.0	400.3	459.2	0
12	632.6	437.7	431.3	389.7	398.4	458.0	0
13	642.5	435.2	424.3	387.6	396.3	457.2	0
14	652.2	432.5	418.3	385.8	394.5	456.6	0
15	659.1	429.7	412.8	384.2	392.0	455.6	0
16	665.9	427.1	408.0	382.3	390.1	454.7	0
17	673.5	424.4	403.6	380.4	387.7	453.9	0
18	680.1	421.5	399.5	378.4	385.3	453.0	0
19	688.5	418.5	395.6	376.7	383.2	452.5	0
20	697.3	414.8	391.7	374.6	380.2	451.7	0
21	705.4	411.1	387.2	372.3	377.1	450.8	0
22	711.5	408.1	385.1	369.4	372.8	449.4	0
23	717.2	405.0	382.2	366.9	369.1	448.1	0
24	723.3	401.9	379.6	364.8	366.7	447.2	0
25	728.8	398.7	377.2	362.8	363.9	446.3	0
26	735.0	395.6	375.0	360.9	361.2	445.5	0
27	743.0	392.6	373.0	359.5	359.0	445.4	0
28	752.0	389.9	371.1	358.0	357.2	445.6	0
29	760.4	386.6	369.3	356.6	355.9	445.8	0
30	769.6	383.9	367.9	355.5	354.4	446.3	0
31	777.8	381.5	367.0	354.8	353.3	446.9	0
32	785.3	379.1	366.1	354.2	352.5	447.4	0
33	791.0	376.8	365.4	353.7	351.9	447.8	0
34	795.4	374.6	365.1	353.6	351.3	448.0	0
35	799.0	372.4	365.0	353.7	350.7	448.2	0
36	803.1	370.4	365.1	353.8	350.6	448.6	0
37	806.6	368.3	365.3	354.0	350.5	448.9	0
38	810.0	366.4	365.7	354.3	350.0	449.3	0
39	813.8	364.6	366.1	354.8	349.8	449.8	0
40	816.6	362.8	366.7	355.5	350.0	450.3	0
41	819.2	361.2	367.4	356.1	350.2	450.9	0
42	821.4	359.7	368.3	356.6	350.6	451.3	0
43	824.3	358.2	369.2	357.4	351.2	452.1	0
44	825.9	356.7	370.1	358.3	351.8	452.5	0
45	826.4	355.5	371.2	359.3	352.6	453.0	0
46	827.6	354.2	372.3	360.2	353.2	453.5	0
47	829.0	352.9	373.5	361.1	353.7	454.0	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	830.8	351.8	374.8	362.1	354.6	454.8	0
49	833.4	350.7	376.2	363.3	355.9	455.9	0
50	836.0	349.6	377.6	364.4	357.3	457.0	0
51	839.2	348.6	379.2	365.6	358.7	458.2	0
52	841.9	347.7	380.9	366.8	359.9	459.4	0
53	844.7	347.0	383.0	367.9	361.4	460.8	0
54	847.4	346.4	385.0	369.1	362.7	462.1	0
55	850.3	345.8	387.0	370.3	364.5	463.6	0
56	852.1	345.2	389.2	371.6	365.6	464.7	0
57	853.5	344.7	391.4	372.7	366.7	465.8	0
58	855.5	344.3	394.0	373.8	367.9	467.1	0
59	858.1	343.9	396.5	375.0	369.9	468.7	0
60	859.6	343.8	399.4	376.2	371.3	470.1	0
61	861.4	343.7	402.4	377.5	372.7	471.5	0
62	863.7	343.6	405.4	378.5	374.2	473.1	0
63	865.8	343.7	408.8	379.7	375.3	474.7	0
64	867.3	343.8	412.2	380.9	377.0	476.3	0
65	866.1	343.7	415.5	381.9	378.3	477.1	0
66	861.9	343.8	418.9	382.9	379.8	477.5	0
67	856.3	343.9	422.0	384.0	381.6	477.6	0
68	851.4	344.2	425.2	385.2	383.2	477.8	0
69	844.0	344.6	428.2	386.2	384.9	477.6	0
70	836.6	345.2	431.0	387.4	386.9	477.4	0
71	828.2	345.6	433.6	388.2	388.6	476.8	0
72	818.9	346.2	436.0	389.1	390.0	476.0	0
73	809.7	346.3	438.0	389.7	392.8	475.3	0
74	800.8	346.9	439.9	390.5	395.2	474.7	0
75	790.8	347.4	441.9	391.3	397.2	473.7	0
76	780.9	348.2	443.9	392.0	399.0	472.8	0
77	771.3	348.6	446.0	392.8	400.4	471.9	0
78	762.1	349.4	448.1	393.6	401.5	470.9	0
79	753.4	350.2	450.3	393.9	402.5	470.1	0
80	744.8	351.0	452.5	394.1	403.1	469.1	0
81	736.7	352.0	454.7	394.6	403.6	468.3	0
82	728.3	352.9	456.9	394.4	404.0	467.3	0
83	719.9	353.8	459.0	394.8	404.1	466.3	0
84	711.4	354.9	460.9	394.7	404.1	465.2	0
85	703.0	355.9	462.6	394.7	404.1	464.1	0
86	695.4	357.0	464.0	394.4	403.8	462.9	0
87	687.2	358.1	465.3	393.9	403.5	461.6	0
88	678.7	359.2	466.4	393.4	403.1	460.2	0
89	671.1	360.3	467.2	392.9	402.6	458.8	0
90	663.0	361.5	467.4	392.6	402.2	457.3	0
91	654.3	362.5	467.4	392.1	401.7	455.6	0
92	644.0	363.6	467.1	391.9	401.1	453.5	0
93	633.3	364.4	466.5	391.1	400.3	451.1	0
94	622.5	365.2	465.6	390.2	399.4	448.6	0
95	612.3	366.4	464.3	390.4	399.4	446.6	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
96	602.0	367.2	463.0	390.3	399.1	444.3	0
97	592.2	368.0	461.5	389.8	398.7	442.0	0
98	583.0	368.7	459.7	389.2	398.1	439.7	0
99	574.0	369.3	457.6	388.5	397.5	437.4	0
100	565.7	370.0	455.4	387.8	396.7	435.1	0
101	558.1	370.5	453.1	386.8	395.8	432.9	0
102	550.4	370.9	450.7	385.8	394.9	430.5	0
103	542.3	371.2	448.3	384.7	394.0	428.1	0
104	534.8	371.4	446.0	383.3	392.9	425.7	0
105	527.5	371.5	443.7	381.9	391.8	423.3	0
106	520.6	371.4	441.6	380.5	390.8	421.0	0
107	514.1	371.2	439.5	379.3	389.7	418.7	0
108	508.0	371.2	437.5	377.9	388.6	416.6	0
109	502.4	370.8	435.5	376.2	387.4	414.5	0
110	497.3	370.5	433.5	374.8	386.1	412.4	0
111	492.6	370.1	431.6	373.2	384.8	410.5	0
112	488.3	369.7	429.9	371.6	383.5	408.6	0
113	484.5	369.2	428.2	370.0	382.2	406.8	0
114	480.6	368.8	426.5	368.4	380.8	405.0	0
115	477.3	368.4	424.9	367.0	379.5	403.4	0
116	474.0	367.9	423.4	365.7	378.2	401.8	0
117	470.4	367.5	421.9	364.2	376.8	400.2	0
118	466.8	367.1	420.3	362.6	375.5	398.5	0
119	463.0	366.8	418.7	361.3	374.2	396.8	0
120	459.6	366.5	416.9	360.0	372.8	395.2	0
121	456.1	366.1	415.2	358.9	371.6	393.6	0
122	453.0	365.8	413.5	357.8	370.3	392.1	0
123	449.7	365.4	411.9	356.8	369.2	390.6	0
124	446.6	365.1	410.4	355.6	367.9	389.1	0
125	443.7	364.7	409.0	354.5	366.8	387.7	0
126	441.3	364.4	407.8	353.4	365.6	386.5	0
127	438.8	363.9	406.6	352.2	364.5	385.2	0
128	436.4	363.5	405.4	351.1	363.3	384.0	0
129	434.3	363.1	404.3	350.1	362.2	382.8	0
130	432.0	362.6	403.1	348.9	361.2	381.5	0
131	429.6	362.1	402.0	348.0	360.2	380.4	0
132	427.7	361.5	400.8	346.9	359.3	379.3	0
133	425.3	361.0	399.7	346.0	358.4	378.1	0
134	423.2	360.5	398.4	345.0	357.4	376.9	0
135	420.9	360.2	397.2	344.7	356.9	376.0	0
136	419.1	359.9	396.0	344.1	356.2	375.1	0
137	417.4	359.8	394.8	343.6	355.5	374.2	0
138	415.7	359.5	393.5	342.8	354.8	373.3	0
139	414.2	359.3	392.1	342.0	354.1	372.3	0
140	412.7	358.9	390.6	341.3	353.4	371.4	0
141	411.2	358.6	389.1	340.5	352.8	370.5	0
142	409.6	358.3	387.7	339.6	352.2	369.5	0
143	408.2	357.8	386.1	338.7	351.5	368.5	0



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
144	406.8	357.4	384.6	338.0	350.8	367.5	0	
145	405.6	356.9	383.2	337.0	350.2	366.6	0	
146	404.4	356.5	381.7	336.2	349.6	365.7	0	
147	403.3	356.1	380.3	335.4	349.1	364.8	0	
148	402.0	355.6	378.9	334.4	348.4	363.9	0	
149	401.1	355.3	377.6	333.7	347.9	363.1	0	
150	400.1	354.8	376.3	332.9	347.5	362.3	0	
151	399.5	354.3	375.2	332.1	347.0	361.6	0	
152	398.8	353.9	374.1	331.3	346.5	360.9	0	
153	397.8	353.4	373.1	330.5	346.2	360.2	0	
154	397.3	352.8	372.1	329.5	345.7	359.5	0	
155	396.6	352.2	371.3	328.9	345.2	358.8	0	
156	396.1	351.6	370.4	328.1	344.9	358.2	0	
157	395.4	351.0	369.5	327.2	344.5	357.5	0	
158	394.9	350.4	368.8	326.6	344.2	357.0	0	
159	394.5	349.9	368.0	325.9	343.9	356.4	0	
160	394.1	349.2	367.3	325.2	343.5	355.9	0	
161	393.8	348.6	366.7	324.4	343.1	355.3	0	
162	393.2	348.1	366.0	323.8	342.8	354.8	0	
163	392.6	347.5	365.4	323.2	342.4	354.2	0	
164	392.2	347.0	364.9	322.7	342.1	353.8	0	
165	391.5	346.5	364.4	321.9	341.6	353.2	0	
166	391.0	346.0	363.9	321.3	341.4	352.7	0	
167	390.6	345.6	363.4	320.7	341.0	352.3	0	
168	390.0	345.1	362.9	320.0	340.6	351.7	0	
169	389.5	344.7	362.4	319.4	340.2	351.2	0	
170	388.9	344.3	361.8	318.8	339.7	350.7	0	
171	388.0	344.0	361.2	318.2	339.2	350.1	0	
172	387.1	343.7	360.5	317.6	338.7	349.5	0	
173	386.1	343.3	359.7	316.9	338.2	348.9	0	
174	385.6	342.9	358.9	316.3	337.7	348.3	0	
175	384.6	342.5	358.2	315.7	337.1	347.6	0	
176	383.9	342.2	357.4	315.2	336.6	347.1	0	
177	383.3	341.9	356.6	314.7	335.9	346.5	0	
178	382.7	341.5	355.9	314.0	335.3	345.9	0	
179	382.0	341.2	355.2	313.4	334.8	345.3	0	
180	381.5	340.9	354.5	312.8	334.1	344.8	0	
181	381.0	340.6	353.8	312.2	333.6	344.2	0	
182	380.4	340.3	353.3	311.6	333.0	343.7	0	
183	380.3	340.0	352.8	310.9	332.4	343.3	0	
184	379.8	339.6	352.3	310.4	331.9	342.8	0	
185	379.2	339.3	351.8	309.8	331.3	342.3	0	
186	378.7	339.1	351.4	309.4	330.6	341.8	0	
187	378.0	338.8	351.0	308.8	330.1	341.4	0	
188	377.6	338.6	350.7	308.4	329.5	340.9	0	
189	377.2	338.3	350.2	307.8	329.0	340.5	0	
190	376.8	338.1	349.7	307.4	328.3	340.1	0	
191	376.5	337.8	349.3	306.9	327.9	339.7	0	

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
192	376.2	337.6	348.9	306.4	327.4	339.3	0	
193	376.0	337.3	348.4	306.0	326.9	338.9	0	
194	375.6	337.1	347.9	305.5	326.4	338.5	0	
195	375.2	336.8	347.5	305.1	325.9	338.1	0	
196	374.9	336.5	347.2	304.6	325.5	337.7	0	
197	374.7	336.2	346.8	304.3	324.9	337.4	0	
198	374.4	335.9	346.4	304.0	324.5	337.1	0	
199	374.4	335.6	346.1	303.5	324.1	336.7	0	
200	374.0	335.2	345.8	303.2	323.6	336.4	0	
201	373.8	334.9	345.4	302.8	323.2	336.0	0	
202	373.6	334.5	345.1	302.4	322.8	335.6	0	
203	373.3	334.0	344.7	302.1	322.2	335.3	0	
204	373.0	333.6	344.3	301.6	321.8	334.9	0	
205	372.7	333.2	343.9	301.2	321.3	334.5	0	
206	372.3	332.7	343.4	300.9	320.8	334.0	0	
207	371.8	332.2	343.0	300.7	320.3	333.6	0	
208	371.4	331.7	342.5	300.3	319.8	333.1	0	
209	371.2	331.1	342.1	299.9	319.2	332.7	0	
210	371.1	330.6	341.7	299.5	318.8	332.3	0	
211	370.5	330.1	341.3	299.3	318.3	331.9	0	
212	369.6	329.7	340.8	298.8	317.8	331.3	0	
213	368.2	329.2	340.3	298.4	317.4	330.7	0	
214	366.8	328.7	339.7	298.1	316.9	330.1	0	
215	365.3	328.3	339.1	297.7	316.5	329.4	0	
216	363.7	327.7	338.5	297.3	316.2	328.7	0	
217	362.4	327.2	337.7	297.0	315.7	328.0	0	
218	361.1	326.7	336.9	296.5	315.2	327.3	0	
219	359.7	326.2	336.2	296.1	314.9	326.6	0	
220	358.6	325.7	335.4	295.6	314.4	325.9	0	
221	357.4	325.2	334.6	295.1	313.8	325.2	0	
222	356.0	324.7	333.8	294.7	313.4	324.5	0	
223	355.0	324.2	333.0	294.2	312.8	323.8	0	
224	354.0	323.7	332.2	293.7	312.4	323.2	0	
225	353.1	323.1	331.4	293.2	311.9	322.5	0	
226	352.0	322.6	330.7	292.8	311.3	321.9	0	
227	351.2	322.1	329.9	292.3	310.8	321.3	0	
228	350.4	321.6	329.2	291.8	310.1	320.6	0	
229	349.6	321.1	328.6	291.2	309.5	320.0	0	
230	348.9	320.6	327.9	290.8	308.9	319.4	0	
231	348.2	320.2	327.3	290.4	308.4	318.9	0	
232	347.6	319.6	326.7	289.9	307.9	318.3	0	
233	346.9	319.1	326.2	289.4	307.3	317.8	0	
234	346.3	318.7	325.7	288.9	306.7	317.2	0	
235	345.6	318.3	325.2	288.6	306.0	316.7	0	
236	345.0	317.8	324.7	288.2	305.4	316.2	0	
237	344.2	317.3	324.2	287.7	304.8	315.7	0	
238	343.4	316.9	323.7	287.4	304.3	315.1	0	
239	342.5	316.4	323.2	287.0	303.8	314.6	0	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
240	341.8	316.0	322.6	286.7	303.1	314.0	0
241	340.9	315.5	322.0	286.2	302.5	313.4	0
242	340.0	315.0	321.4	285.9	301.9	312.8	0
243	339.2	314.5	320.7	285.4	301.3	312.2	0
244	338.2	313.9	320.0	285.2	300.6	311.6	0
245	337.2	313.2	319.3	284.6	300.0	310.9	0
246	336.0	312.6	318.5	284.2	299.4	310.1	0
247	335.0	311.9	317.8	283.7	298.8	309.5	0
248	333.9	311.3	317.1	283.3	298.2	308.8	0
249	332.8	310.6	316.4	282.8	297.6	308.0	0
250	331.7	309.8	315.7	282.3	297.0	307.3	0
251	330.7	309.1	314.9	281.8	296.3	306.6	0
252	329.6	308.3	314.3	281.3	295.7	305.8	0
253	328.4	307.5	313.6	280.8	295.0	305.1	0
254	327.4	306.6	312.9	280.2	294.4	304.3	0
255	326.2	305.8	312.3	279.6	293.8	303.5	0
256	325.1	304.9	311.6	278.9	293.2	302.7	0
257	324.0	304.1	311.0	278.4	292.5	302.0	0
258	323.2	303.2	310.3	277.8	291.8	301.3	0
259	322.4	302.4	309.6	277.3	291.1	300.6	0
260	321.7	301.7	308.9	276.6	290.5	299.9	0
261	321.0	300.9	308.0	276.0	289.8	299.1	0
262	320.2	300.2	307.2	275.4	289.1	298.4	0
263	319.5	299.6	306.3	274.9	288.4	297.7	0
264	318.6	298.8	305.4	274.4	287.7	297.0	0
265	317.8	298.1	304.5	273.8	287.1	296.2	0
266	316.9	297.3	303.6	273.1	286.4	295.5	0
267	316.1	296.6	302.7	272.5	285.7	294.7	0
268	315.3	295.8	301.9	272.0	285.1	294.0	0
269	314.1	295.1	301.0	271.5	284.4	293.2	0
270	313.0	294.3	300.2	270.9	283.7	292.4	0
271	311.7	293.5	299.3	270.2	283.1	291.6	0
272	310.8	292.9	298.7	269.5	282.5	290.9	0
273	309.6	292.0	298.0	269.0	281.8	290.1	0
274	308.6	291.3	297.4	268.4	281.1	289.4	0
275	307.6	290.6	296.9	267.7	280.4	288.7	0
276	306.7	289.9	296.4	267.0	279.8	288.0	0
277	305.7	289.2	296.1	266.4	279.2	287.3	0
278	305.7	289.2	296.1	266.4	279.2	287.3	0
Average	512.4	351.1	379.9	338.0	349.1	386	0

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

		Sample ID	Tare, mg		Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0131	188.4		191.5	3.1
	<b>B</b>	H0132	188.1		191.3	3.2
	<b>C - 1st Hour</b>	H0133	188.0		190.7	2.7
	<b>Amb</b>	H0151	89.6		89.7	0.1
<b>Probes</b>	<b>A</b>	16A	116379.8		116379.8	0.0
	<b>B</b>	16B	115860.4		115860.4	0.0
	<b>C - 1st Hour</b>	16C	114147.9		114147.9	0.0
<b>O-rings</b>	<b>A</b>	16A	3572.9		3572.7	0.0*
	<b>B</b>	16B	3638.7		3638.6	0.0*
	<b>C - 1st Hour</b>	16C	3601.8		3601.8	0.0

\*Negative value corrected to zero

**Placed in Dessicator on:** 12/25/2022

<b>Filters</b>	<b>A</b>	191.8	12/21 4:58	191.6	12/31 12:01	191.5	1/3 9:44		
	<b>B</b>	191.3	12/21 4:58	191.2	12/31 12:01	191.3	1/3 9:44		
	<b>C - 1st Hour</b>	190.9	12/21 4:58	190.6	12/31 12:01	190.7	1/3 9:44		
	<b>Amb</b>	89.6	12/21 4:58	89.7	12/31 12:13	89.7	1/3 9:44		
<b>Probes</b>	<b>A</b>			116379.9	12/31 12:08	116379.8	1/3 9:44		
	<b>B</b>			115860.5	12/31 12:08	115860.4	1/3 9:44		
	<b>C - 1st Hour</b>			114148.0	12/31 12:08	114147.9	1/3 9:44		
<b>O-Rings</b>	<b>A</b>			3572.9	12/31 12:01	3572.6	1/3 9:45	3572.7	1/4 10:32
	<b>B</b>			3638.6	12/31 12:01	3638.6	1/3 9:45		
	<b>C - 1st Hour</b>			3601.9	12/31 12:01	3601.8	1/3 9:45		

<b>Train A Aggregate, mg:</b>	<b>3.1</b>
<b>Train B Aggregate, mg:</b>	<b>3.2</b>
<b>Train C Aggregate, mg:</b>	<b>2.7</b>
<b>Ambient Aggregate, mg:</b>	<b>0.1</b>

**WOOD STOVE TEST DATA PACKET**  
**ASTM E3053/E2515**



**Run 2 Data Summary**

Client: SBI  
Model: 5.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/19/2022

*Data from 12/20/22 testing - reference only*

  
\_\_\_\_\_  
Technician Signature

7/12/2023  
\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBIModel: 1.7RRun #: 2Job #: 22-835Tracking #: 135Technician: AKDate: 12/19/2022

<b>Burn Rate (kg/hr):</b>	<b>1.15</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	76.727	60.183	60.416	10.388
Average Gas Velocity in Dilution Tunnel (ft/sec)	23.54			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	27603.2			
Average Gas Meter Temperature (°F)	77.6	72.6	72.0	73.6
Total Sample Volume (dscf)	75.111	60.235	60.295	10.135
Average Tunnel Temperature (°F)	87.2			
Total Time of Test (min)	342			
Total Particulate Catch (mg)	0.2	3.2	3.4	3.2
Particulate Concentration, dry-standard (g/dscf)	0.0000027	0.0000531	0.0000564	0.0003157
Total PM Emissions (g)	0.42	7.94	8.45	8.64
Particulate Emission Rate (g/hr)	0.07	1.39	1.48	8.64
Emissions Factor (g/kg)	-	1.22	1.30	-
Difference from Average Total Particulate Emissions (g)	-	0.26	0.26	-
Difference from Average Total Particulate Emissions (%)	-	3.1%	3.1%	-
Difference from Average Emissions Factor (g/kg)	-	0.04	0.04	-

Final Average Results	
Total Particulate Emissions (g)	8.20
Particulate Emission Rate (g/hr)	1.44
Emissions Factor (g/kg)	1.26
HHV Efficiency (%)	75.1%
LHV Efficiency (%)	80.4%
CO Emissions (g/min)	0.56

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 80.3/Max: 89.6	OK
Face Velocity	< 30 ft/min	10.0	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:72.4/Max:90	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/19/22  
**Run:** 2  
**Control #:** 22-835  
**Test Duration:** 342  
**Output Category:** Low

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	75.1%	80.4%
<b>Combustion Efficiency</b>	98.1%	98.1%
<b>Heat Transfer Efficiency</b>	76.5%	82.0%

<b>Output Rate (kJ/h)</b>	16,184	15,353	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.15	2.53	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	21,563	20,455	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.54	14.41	<b>dry lb</b>
<b>MC wet (%)</b>	16.31		
<b>MC dry (%)</b>	19.49		
<b>Particulate (g)</b>	8.20		
<b>CO (g)</b>	192		
<b>Test Duration (h)</b>	5.70		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.09	2.08
<b>g/kg Dry Fuel</b>	1.25	29.36
<b>g/h</b>	1.44	33.68
<b>g/min</b>	0.02	0.56
<b>lb/MM Btu Output</b>	0.21	4.84

<b>Air/Fuel Ratio (A/F)</b>	15.14
-----------------------------	-------

VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/19/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.91  
 Max Allowable Start-up Fuel Weight (lbs): 4.36

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	15.75	3.17	In Range	29.0	21.5	18.3	22.9	In Range	2.58	1.17	
2	15.75	2.47	In Range	28.8	18.0	15.0	20.6	In Range	2.05	0.93	
3	16.00	2.88	In Range	25.5	17.9	16.6	20.0	In Range	2.40	1.09	
Core Load Wt. (lbs)		8.52	In Range								

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	16.00	3.64	In Range	26.8	16.7	17.2	20.2	In Range	3.03	1.37	
2	16.00	2.38	In Range	27.0	13.6	14.6	18.4	In Range	2.01	0.91	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.02	In Range								

Total Load Weight (lbs): 14.54 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: 101% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.1  
 Total Load Average Moisture Content (%DB): 20.5 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.0  
 Total Test Load Weight (dry basis): 12.06 lbs 5.47 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
		1	2	3				lbs	kg
2.84	In Range	10	10	10	10.0	In Range	2.58	1.17	

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
		1	2	3				lbs	kg
4.30	In Range	25.5	17.2	19.7	20.8	In Range	3.56	1.61	

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): Out of Range



## LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/19/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 12  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 17.28  
 Total Load Weight Range (lbs): 16.42 to 18.14  
 Core Load Weight Range (lbs): 7.78 to 11.23  
 Remainder Load Weight Range (lbs): 6.05 to 9.50  
 Core Load Piece Range (lbs): 2.59 to 4.32  
 Remainder Load Piece Range (lbs): 1.73 to 5.18

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	15.75	3.57	In Range	26.4	19.0	16.1	20.5	In Range	2.96	1.34
2	16.00	3.35	In Range	26.9	15.9	18.9	20.6	In Range	2.78	1.26
3	16.00	3.50	In Range	21.7	16.6	18.1	18.8	In Range	2.95	1.34
Core Load Wt. (lbs)		10.42	In Range							

### REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.25	4.21	In Range	25.1	17.6	11.3	18.0	In Range	3.57	1.62
2	15.75	2.72	In Range	25.8	16.7	17.7	20.1	In Range	2.27	1.03
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.93	In Range							

Remainder Load Small/Large Piece Weight Ratio: 65% In Range ≤ 67%  
 Total Load Weight (lbs): 17.35 In Range  
 Core Load % of Total Weight: 60% In Range 45-65%  
 Remainder % of Total Weight: 40% In Range 35-55%  
 Total Load % of Target Weight: 100% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 12.0  
 Total Load Average Moisture Content (%DB): 19.5 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.3  
 Total Test Load Weight (dry basis): 14.52 lbs 6.59 kg

### TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 1.8 to 3.4  
 Actual Charcoal Bed Wt. (lb): 2.91 In Range

### TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.13 Valid Test (≥90%)

Total Fuel Burned During Test Run:  
 17.2 lbs, wet basis  
 14.4 lbs, dry basis  
 6.53 kg, dry basis

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2  
 Test Start Time: 14:14  
 Test Type: Low Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 342

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.49	29.59	29.54
Relative Humidity (%)	34.5	27.0	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	76.727 ft <sup>3</sup>		

**Sample Train Post-Test Leak Checks**

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

### DILUTION TUNNEL FLOW

**Traverse Data**

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.121	71
2	0.142	71
3	0.136	71
4	0.121	71
5	0.093	71
6	0.130	71
7	0.137	71
8	0.124	71
Center	0.141	71

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

$V_{strav}$ : 23.68 ft/sec  
 $V_{scent}$ : 25.15 ft/sec  
 $F_p$ : 0.942 [ratio]  
 Initial Tunnel Flow: 476.5 scf/min

Static Pressure: -0.293 in. H<sub>2</sub>O

### 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 2

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/19/2022

**Low Fire Performed as a continuation of High Fire Test, see Run 1 test data for details**

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.129	0.00	73.7	0.23		17.22		121.5	409.7	86.6	87.0
1			0.128	0.00	73.7	0.24	-	17.07	-0.14	120.2	383.0	86.3	89.6
2			0.127	0.00	73.7	0.23	-	16.85	-0.22	128.9	419.1	86.5	89.9
3			0.128	0.00	73.7	0.24	-	16.56	-0.29	124.8	497.8	86.7	89.1
4			0.129	0.00	73.7	0.23	-	16.37	-0.19	115.1	525.1	86.0	86.7
5			0.131	0.00	73.7	0.23	-	16.20	-0.17	113.8	545.2	85.6	85.4
6			0.129	0.00	73.7	0.24	-	16.04	-0.16	111.5	548.7	85.3	86.2
7			0.130	0.00	73.8	0.23	-	15.86	-0.17	111.9	556.2	85.2	85.8
8			0.131	0.00	73.8	0.24	-	15.68	-0.18	107.8	562.9	84.8	87.9
9			0.130	0.00	73.9	0.22	-	15.50	-0.18	105.3	555.1	84.4	89.5
10	1.771	0.177	0.131	0.00	73.9	0.24	105	15.33	-0.17	105.5	545.4	84.0	89.9
11			0.131	0.00	73.9	0.25	-	15.17	-0.16	108.4	539.1	84.1	88.3
12			0.130	0.00	73.9	0.23	-	15.04	-0.13	108.8	534.4	84.1	87.7
13			0.130	0.00	73.8	0.25	-	14.89	-0.15	112.8	529.4	84.1	87.3
14			0.131	0.00	73.8	0.24	-	14.74	-0.15	112.0	537.2	84.3	84.0
15			0.130	0.00	73.8	0.25	-	14.56	-0.17	110.6	544.6	84.1	84.4
16			0.130	0.00	73.8	0.24	-	14.48	-0.08	107.6	522.0	83.6	87.4
17			0.132	0.00	73.8	0.23	-	14.34	-0.14	103.3	500.8	83.2	87.6
18			0.133	0.00	73.7	0.23	-	14.23	-0.10	100.2	483.3	82.7	89.8
19			0.132	0.00	73.7	0.22	-	14.12	-0.12	100.9	465.6	82.4	89.8
20	3.501	0.173	0.132	0.00	73.6	0.22	101	14.01	-0.10	102.6	449.3	82.1	89.6
21			0.131	0.00	73.6	0.22	-	13.94	-0.07	103.4	434.1	81.8	87.9
22			0.132	0.00	73.5	0.21	-	13.86	-0.08	102.9	421.0	81.5	87.6
23			0.134	0.00	73.6	0.21	-	13.80	-0.07	102.3	410.4	81.6	86.8
24			0.133	0.00	73.5	0.22	-	13.72	-0.08	101.7	401.3	82.4	86.8
25			0.133	0.00	73.5	0.22	-	13.67	-0.05	97.9	389.8	83.0	88.3
26			0.134	0.00	73.5	0.21	-	13.59	-0.08	95.2	377.7	83.3	90.0
27			0.134	0.00	73.5	0.23	-	13.48	-0.10	97.0	372.1	83.9	89.6
28			0.134	0.00	73.4	0.23	-	13.39	-0.09	99.2	371.6	84.5	88.7
29			0.134	0.00	73.5	0.25	-	13.30	-0.09	100.3	382.2	85.1	87.3
30	5.210	0.171	0.133	0.00	73.5	0.25	99	13.22	-0.08	100.3	392.7	85.5	86.2
31			0.134	0.00	73.4	0.26	-	13.12	-0.10	100.4	400.1	86.0	86.4
32			0.134	0.00	73.4	0.27	-	13.03	-0.09	100.4	408.6	86.5	86.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.134	0.00	73.4	0.25	-	12.93	-0.10	100.5	415.7	86.9	85.9
34			0.132	0.00	73.4	0.26	-	12.82	-0.11	100.6	421.9	87.0	86.0
35			0.133	0.00	73.3	0.26	-	12.71	-0.11	100.6	427.7	86.7	85.6
36			0.133	0.00	73.3	0.27	-	12.61	-0.10	101.0	433.1	86.5	86.1
37			0.133	0.00	73.3	0.25	-	12.50	-0.10	101.6	438.5	86.1	84.7
38			0.133	0.00	73.3	0.26	-	12.41	-0.09	101.2	442.5	85.8	83.4
39			0.133	0.00	73.3	0.26	-	12.33	-0.08	100.8	444.8	85.6	83.6
40	6.938	0.173	0.133	0.00	73.4	0.27	100	12.22	-0.11	100.3	448.0	85.2	81.4
41			0.134	0.00	73.4	0.27	-	12.12	-0.10	98.6	449.7	84.8	81.1
42			0.134	0.00	73.4	0.27	-	12.01	-0.11	97.6	451.7	84.6	81.9
43			0.134	0.00	73.5	0.25	-	11.91	-0.11	97.2	452.8	84.4	81.9
44			0.134	0.00	73.5	0.25	-	11.77	-0.13	96.9	454.1	84.1	81.7
45			0.135	0.00	73.6	0.25	-	11.67	-0.11	96.7	455.3	83.8	81.5
46			0.135	0.00	73.5	0.25	-	11.53	-0.14	96.6	457.5	83.6	81.1
47			0.134	0.00	73.5	0.26	-	11.39	-0.14	96.4	459.3	83.6	81.6
48			0.134	0.00	73.5	0.26	-	11.26	-0.13	96.4	461.1	83.4	80.7
49			0.134	0.00	73.5	0.25	-	11.13	-0.13	96.2	462.8	83.3	80.7
50	8.661	0.172	0.135	0.00	73.5	0.25	99	10.97	-0.15	96.1	464.8	83.2	80.9
51			0.134	0.00	73.6	0.25	-	10.84	-0.13	96.4	465.7	82.9	80.8
52			0.135	0.00	73.6	0.25	-	10.73	-0.11	96.0	464.8	82.8	79.6
53			0.134	0.00	73.5	0.25	-	10.57	-0.15	96.1	466.1	82.8	80.1
54			0.134	0.00	73.5	0.26	-	10.43	-0.14	96.0	466.1	82.7	80.4
55			0.135	0.00	73.5	0.26	-	10.29	-0.14	95.9	465.6	82.5	80.1
56			0.135	0.00	73.5	0.26	-	10.17	-0.13	95.8	465.0	82.4	79.4
57			0.135	0.00	73.5	0.26	-	10.03	-0.14	95.7	462.8	82.3	79.5
58			0.133	0.00	73.6	0.25	-	9.89	-0.14	95.6	462.4	82.2	80.5
59			0.134	0.00	73.6	0.26	-	9.77	-0.13	95.4	462.3	82.2	80.7
60	10.388	0.173	0.133	0.00	73.6	0.26	99	9.63	-0.14	95.4	461.0	82.2	80.0
61			0.134	0.00	73.6	0.25	-	9.53	-0.10	95.4	459.4	82.2	79.7
62			0.136	0.00	73.5	0.26	-	9.37	-0.15	95.3	457.5	82.1	79.1
63			0.134	0.00	73.5	0.25	-	9.20	-0.17	95.2	454.7	82.1	78.1
64			0.134	0.00	73.5	0.25	-	9.05	-0.15	94.8	453.8	82.0	76.1
65			0.135	0.00	73.5	0.26	-	8.91	-0.15	94.9	454.1	82.0	76.4

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.132	0.00	73.5	0.25	-	8.76	-0.14	94.8	455.0	82.1	76.1
67			0.135	0.00	73.4	0.25	-	8.60	-0.16	94.7	454.9	82.9	75.5
68			0.135	0.00	73.5	0.26	-	8.45	-0.15	94.6	455.6	83.9	75.1
69			0.134	0.00	73.5	0.26	-	8.31	-0.14	94.6	455.9	84.8	74.8
70	12.101	0.171	0.136	0.00	73.4	0.26	98	8.17	-0.14	94.5	455.5	85.6	74.8
71			0.135	0.00	73.4	0.27	-	8.03	-0.14	94.5	456.0	86.3	74.3
72			0.134	0.00	73.4	0.26	-	7.88	-0.15	94.5	456.1	86.2	74.2
73			0.135	0.00	73.5	0.27	-	7.75	-0.13	94.3	456.2	85.7	74.0
74			0.135	0.00	73.4	0.26	-	7.61	-0.14	94.2	456.1	85.1	73.8
75			0.135	0.00	73.4	0.27	-	7.47	-0.14	94.2	457.0	84.8	73.5
76			0.134	0.00	73.4	0.27	-	7.33	-0.14	94.3	459.4	84.4	73.3
77			0.135	0.00	73.4	0.28	-	7.20	-0.13	94.1	460.3	84.1	73.2
78			0.135	0.00	73.4	0.28	-	7.06	-0.14	94.1	462.5	83.8	73.3
79			0.136	0.00	73.4	0.27	-	6.94	-0.12	94.2	464.9	83.5	72.9
80	13.818	0.172	0.135	0.00	73.4	0.28	98	6.80	-0.15	94.2	467.6	83.3	73.2
81			0.135	0.00	73.3	0.29	-	6.66	-0.14	94.5	468.2	83.0	73.2
82			0.136	0.00	73.3	0.30	-	6.51	-0.15	94.2	469.1	82.9	72.9
83			0.135	0.00	73.4	0.30	-	6.40	-0.11	94.4	471.5	82.7	73.0
84			0.135	0.00	73.4	0.32	-	6.26	-0.14	94.4	473.4	82.5	73.2
85			0.135	0.00	73.3	0.33	-	6.13	-0.13	94.5	475.9	82.2	73.2
86			0.134	0.00	73.3	0.34	-	5.99	-0.13	94.6	477.6	82.0	73.0
87			0.134	0.00	73.4	0.40	-	5.86	-0.13	94.7	479.8	81.9	72.7
88			0.135	0.00	73.4	0.45	-	5.72	-0.14	94.7	481.1	82.5	72.6
89			0.134	0.00	73.5	0.50	-	5.58	-0.14	95.0	481.5	83.3	72.6
90	15.515	0.170	0.134	0.00	73.3	0.53	97	5.46	-0.12	94.9	481.2	83.9	72.6
91			0.134	0.00	73.4	0.59	-	5.33	-0.13	94.7	479.3	84.6	73.2
92			0.134	0.00	73.4	0.59	-	5.21	-0.12	94.7	476.9	85.3	73.3
93			0.135	0.00	73.5	0.59	-	5.11	-0.10	94.4	471.3	85.7	73.3
94			0.133	0.00	73.5	0.60	-	4.98	-0.13	94.3	467.4	86.2	73.2
95			0.135	0.00	73.5	0.62	-	4.89	-0.10	94.2	464.6	86.6	73.3
96			0.135	0.00	73.5	0.65	-	4.79	-0.10	93.9	461.4	86.9	72.4
97			0.134	0.00	73.4	0.65	-	4.68	-0.11	94.0	458.8	87.2	72.9
98			0.134	0.00	73.4	0.66	-	4.58	-0.10	93.6	456.3	87.1	74.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.135	0.00	73.4	0.65	-	4.48	-0.09	93.9	457.6	86.4	75.7
100	17.229	0.171	0.134	0.00	73.4	0.65	98	4.42	-0.06	94.0	457.8	86.0	76.1
101			0.133	0.00	73.4	0.66	-	4.32	-0.10	94.0	457.2	85.4	76.6
102			0.135	0.00	73.5	0.68	-	4.26	-0.06	93.9	456.4	85.1	76.8
103			0.134	0.00	73.5	0.69	-	4.20	-0.06	93.9	456.1	84.8	77.5
104			0.133	0.00	73.5	0.69	-	4.13	-0.07	93.7	449.2	84.7	77.8
105			0.134	0.00	73.4	0.68	-	4.09	-0.04	93.4	441.7	84.4	78.1
106			0.135	0.00	73.4	0.69	-	4.03	-0.06	93.2	436.4	84.2	77.9
107			0.134	0.00	73.4	0.69	-	3.98	-0.05	92.7	432.8	83.9	78.0
108			0.135	0.00	73.4	0.68	-	3.94	-0.04	92.7	428.2	83.8	78.4
109			0.134	0.00	73.4	0.69	-	3.88	-0.06	92.4	422.1	83.6	78.4
110	18.965	0.174	0.135	0.00	73.4	0.68	99	3.85	-0.03	92.0	414.7	83.5	78.8
111			0.134	0.00	73.4	0.70	-	3.81	-0.04	91.6	407.7	83.3	78.1
112			0.134	0.00	73.4	0.69	-	3.78	-0.03	91.4	401.6	83.2	78.7
113			0.134	0.00	73.4	0.68	-	3.73	-0.04	91.0	395.3	83.1	79.4
114			0.134	0.00	73.5	0.68	-	3.71	-0.03	90.8	390.8	82.8	78.6
115			0.135	0.00	73.5	0.68	-	3.66	-0.05	90.6	386.4	82.7	79.5
116			0.136	0.00	73.5	0.68	-	3.61	-0.05	90.4	382.6	82.5	79.2
117			0.133	0.00	73.5	0.69	-	3.58	-0.03	90.3	379.6	82.3	79.2
118			0.135	0.00	73.4	0.68	-	3.54	-0.04	89.9	376.6	82.2	78.8
119			0.136	0.00	73.4	0.68	-	3.50	-0.04	89.8	374.6	81.9	79.1
120	20.729	0.176	0.135	0.00	73.3	0.68	101	3.47	-0.03	89.7	372.9	81.8	78.9
121			0.135	0.00	73.3	0.67	-	3.43	-0.05	89.6	371.5	81.6	79.3
122			0.135	0.00	73.2	0.67	-	3.37	-0.05	89.4	370.1	81.4	79.4
123			0.135	0.00	73.3	0.68	-	3.35	-0.02	89.3	368.0	81.1	79.1
124			0.135	0.00	73.3	0.68	-	3.32	-0.03	89.2	366.2	80.9	79.3
125			0.136	0.00	73.3	0.69	-	3.28	-0.04	89.0	364.2	81.5	79.2
126			0.135	0.00	73.3	0.68	-	3.25	-0.03	88.8	362.2	82.3	79.6
127			0.134	0.00	73.2	0.69	-	3.20	-0.04	88.8	360.2	83.2	79.3
128			0.135	0.00	73.2	0.68	-	3.18	-0.03	88.5	358.5	83.9	79.7
129			0.136	0.00	73.2	0.68	-	3.14	-0.03	88.4	357.1	84.4	79.5
130	22.491	0.176	0.135	0.00	73.2	0.68	100	3.10	-0.04	88.2	355.6	84.8	79.4
131			0.134	0.00	73.2	0.69	-	3.08	-0.02	88.2	353.5	85.2	79.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132			0.135	0.00	73.1	0.69	-	3.04	-0.04	87.9	350.5	85.6	79.5
133			0.134	0.00	73.1	0.69	-	3.02	-0.03	87.7	346.9	86.0	79.6
134			0.134	0.00	73.1	0.69	-	2.99	-0.03	87.5	343.9	86.4	79.1
135			0.135	0.00	73.0	0.69	-	2.96	-0.02	87.4	340.8	86.7	79.0
136			0.134	0.00	73.1	0.69	-	2.94	-0.02	87.1	338.0	87.1	79.1
137			0.136	0.00	73.1	0.70	-	2.92	-0.02	87.0	335.6	87.2	79.4
138			0.135	0.00	73.2	0.69	-	2.90	-0.02	86.9	333.2	87.4	79.2
139			0.135	0.00	73.1	0.68	-	2.88	-0.02	86.8	331.4	86.5	79.0
140	24.246	0.176	0.134	0.00	73.1	0.69	100	2.85	-0.03	86.6	329.5	85.5	79.3
141			0.134	0.00	73.0	0.68	-	2.83	-0.02	86.5	328.0	84.7	79.3
142			0.134	0.00	73.0	0.68	-	2.81	-0.02	86.4	326.4	84.1	79.0
143			0.134	0.00	73.1	0.68	-	2.78	-0.03	86.2	324.3	83.3	79.3
144			0.134	0.00	73.0	0.67	-	2.74	-0.04	86.1	322.8	82.8	79.3
145			0.135	0.00	73.0	0.68	-	2.73	-0.01	85.9	321.5	82.3	79.6
146			0.136	0.00	73.0	0.66	-	2.71	-0.02	85.7	320.0	81.8	78.8
147			0.135	0.00	73.0	0.67	-	2.68	-0.03	85.7	318.3	81.3	79.1
148			0.136	0.00	72.9	0.66	-	2.65	-0.04	85.6	316.6	81.0	78.7
149			0.135	0.00	72.9	0.67	-	2.63	-0.02	85.5	314.9	80.5	78.8
150	26.004	0.176	0.136	0.00	73.0	0.67	100	2.61	-0.01	85.3	312.9	81.2	78.5
151			0.135	0.00	72.9	0.68	-	2.59	-0.02	85.3	311.6	82.1	78.8
152			0.135	0.00	73.0	0.68	-	2.58	-0.02	85.2	310.1	82.8	78.6
153			0.137	0.00	72.9	0.69	-	2.55	-0.02	85.1	308.8	83.4	78.9
154			0.135	0.00	72.9	0.67	-	2.52	-0.03	85.1	306.7	84.2	78.2
155			0.135	0.00	73.0	0.68	-	2.50	-0.02	84.9	305.1	84.6	79.1
156			0.134	0.00	73.0	0.67	-	2.49	-0.02	84.8	303.8	85.1	78.9
157			0.135	0.00	73.0	0.67	-	2.46	-0.02	84.7	302.9	85.6	78.8
158			0.135	0.00	73.1	0.67	-	2.45	-0.01	84.7	301.8	86.0	78.2
159			0.136	0.00	73.1	0.66	-	2.43	-0.01	84.5	300.7	86.2	78.8
160	27.765	0.176	0.136	0.00	73.0	0.67	100	2.41	-0.03	84.5	299.8	86.5	78.8
161			0.136	0.00	72.9	0.68	-	2.38	-0.03	84.4	299.2	86.8	78.7
162			0.137	0.00	72.9	0.67	-	2.34	-0.04	84.3	298.7	86.5	78.3
163			0.136	0.00	72.8	0.68	-	2.32	-0.02	84.2	298.4	85.7	78.3
164			0.135	0.00	72.7	0.67	-	2.30	-0.03	84.1	298.3	85.2	78.4



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165			0.137	0.00	72.6	0.67	-	2.27	-0.03	84.1	297.8	84.8	78.1
166			0.137	0.00	72.6	0.67	-	2.25	-0.02	84.0	296.1	84.4	78.2
167			0.136	0.00	72.6	0.67	-	2.23	-0.02	83.9	294.4	84.1	78.1
168			0.137	0.00	72.6	0.67	-	2.22	-0.01	83.8	293.2	83.7	78.3
169			0.136	0.00	72.7	0.68	-	2.20	-0.02	83.7	292.1	83.4	77.6
170	29.523	0.176	0.136	0.00	72.6	0.67	99	2.17	-0.02	83.7	291.1	83.2	78.1
171			0.136	0.00	72.7	0.68	-	2.15	-0.02	83.7	290.5	83.0	78.2
172			0.136	0.00	72.7	0.68	-	2.12	-0.03	83.5	288.9	82.7	77.8
173			0.136	0.00	72.6	0.68	-	2.10	-0.02	83.6	288.1	82.6	78.0
174			0.136	0.00	72.5	0.68	-	2.08	-0.02	83.4	287.0	82.5	77.3
175			0.136	0.00	72.5	0.67	-	2.05	-0.03	83.3	286.1	82.4	77.1
176			0.137	0.00	72.4	0.67	-	2.04	-0.01	83.2	285.4	82.2	77.1
177			0.137	0.00	72.5	0.67	-	2.02	-0.02	83.2	285.1	82.0	77.7
178			0.137	0.00	72.6	0.68	-	2.00	-0.02	83.2	283.8	82.1	78.0
179			0.136	0.00	72.7	0.68	-	1.98	-0.02	83.1	283.1	82.8	78.0
180	31.303	0.178	0.135	0.00	72.6	0.67	101	1.96	-0.02	83.0	282.2	83.5	77.9
181			0.136	0.00	72.6	0.68	-	1.95	-0.02	83.0	281.5	84.1	78.2
182			0.137	0.00	72.7	0.69	-	1.93	-0.02	82.9	281.1	84.6	77.6
183			0.137	0.00	72.7	0.68	-	1.91	-0.02	82.8	280.0	84.9	77.8
184			0.136	0.00	72.6	0.68	-	1.89	-0.02	82.9	278.8	85.4	77.6
185			0.137	0.00	72.6	0.67	-	1.87	-0.02	83.0	278.2	85.7	78.0
186			0.136	0.00	72.6	0.69	-	1.86	-0.01	82.8	277.0	86.0	78.3
187			0.137	0.00	72.6	0.69	-	1.84	-0.02	82.7	276.3	85.8	77.4
188			0.138	0.00	72.6	0.68	-	1.81	-0.03	82.6	275.8	85.0	77.1
189			0.137	0.00	72.7	0.69	-	1.78	-0.03	82.7	275.0	84.4	77.5
190	33.078	0.178	0.136	0.00	72.6	0.68	100	1.76	-0.01	82.5	274.6	83.7	76.3
191			0.137	0.00	72.6	0.68	-	1.73	-0.03	82.4	274.0	83.3	77.1
192			0.137	0.00	72.6	0.68	-	1.72	-0.01	82.4	273.2	82.9	77.7
193			0.136	0.00	72.5	0.68	-	1.71	-0.02	82.3	272.8	82.5	77.4
194			0.137	0.00	72.5	0.68	-	1.69	-0.02	82.3	271.9	82.2	77.6
195			0.137	0.00	72.4	0.68	-	1.67	-0.02	82.2	271.7	81.8	77.5
196			0.137	0.00	72.4	0.67	-	1.65	-0.02	82.1	271.3	81.6	76.5
197			0.137	0.00	72.4	0.67	-	1.63	-0.03	82.1	270.9	81.5	76.5

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198			0.137	0.00	72.5	0.66	-	1.61	-0.02	82.0	270.1	81.2	76.7
199			0.136	0.00	72.5	0.68	-	1.59	-0.02	82.1	269.5	81.4	76.7
200	34.858	0.178	0.136	0.00	72.5	0.67	101	1.56	-0.03	82.0	268.6	82.0	76.3
201			0.137	0.00	72.4	0.68	-	1.55	-0.01	82.0	268.3	82.7	75.9
202			0.136	0.00	72.4	0.68	-	1.53	-0.02	81.9	268.0	83.1	75.7
203			0.136	0.00	72.3	0.68	-	1.50	-0.02	81.8	267.1	83.6	76.5
204			0.136	0.00	72.2	0.67	-	1.49	-0.01	81.8	265.8	84.0	76.8
205			0.137	0.00	72.2	0.67	-	1.48	-0.01	81.6	264.9	84.2	76.5
206			0.136	0.00	72.1	0.68	-	1.46	-0.02	81.5	264.5	84.6	75.9
207			0.136	0.00	72.1	0.67	-	1.44	-0.02	81.6	264.2	85.2	75.8
208			0.137	0.00	72.1	0.67	-	1.42	-0.02	81.6	263.7	85.4	75.8
209			0.136	0.00	72.2	0.68	-	1.40	-0.02	81.5	263.5	85.5	76.0
210	36.637	0.178	0.138	0.00	72.1	0.67	100	1.38	-0.02	81.5	262.8	85.7	76.1
211			0.136	0.00	72.1	0.70	-	1.37	0.00	81.4	262.3	86.0	75.7
212			0.138	0.00	72.2	0.68	-	1.35	-0.02	81.4	261.7	86.2	76.1
213			0.136	0.00	72.1	0.68	-	1.34	-0.02	81.3	261.1	86.4	75.4
214			0.136	0.00	72.1	0.69	-	1.32	-0.02	81.4	260.5	86.6	76.1
215			0.136	0.00	72.0	0.69	-	1.30	-0.01	81.2	259.5	86.7	76.3
216			0.137	0.00	72.0	0.69	-	1.28	-0.02	81.2	259.3	86.9	76.0
217			0.136	0.00	72.0	0.68	-	1.26	-0.01	81.2	258.6	86.8	76.1
218			0.136	0.00	72.0	0.68	-	1.25	-0.01	81.1	258.2	86.2	76.4
219			0.135	0.00	72.0	0.70	-	1.24	-0.01	81.1	257.6	85.7	76.0
220	38.417	0.178	0.136	0.00	72.0	0.69	100	1.21	-0.02	81.1	257.0	85.2	75.8
221			0.136	0.00	72.0	0.70	-	1.19	-0.02	81.0	256.6	84.9	76.3
222			0.136	0.00	72.0	0.69	-	1.19	0.00	81.0	256.1	84.6	76.7
223			0.137	0.00	71.9	0.69	-	1.18	-0.02	80.9	255.5	84.3	76.0
224			0.137	0.00	72.0	0.69	-	1.15	-0.03	80.9	255.2	84.1	76.3
225			0.136	0.00	72.0	0.69	-	1.15	-0.01	80.9	254.4	83.7	76.4
226			0.138	0.00	72.0	0.69	-	1.13	-0.02	80.7	253.6	83.5	76.4
227			0.135	0.00	72.1	0.69	-	1.10	-0.03	80.8	253.0	83.3	76.5
228			0.136	0.00	72.0	0.68	-	1.10	0.00	80.6	252.1	83.1	76.1
229			0.135	0.00	72.0	0.68	-	1.08	-0.02	80.6	251.1	83.0	76.4
230	40.196	0.178	0.136	0.00	72.1	0.69	100	1.08	-0.01	80.7	250.3	83.2	75.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231			0.137	0.00	72.1	0.69	-	1.05	-0.03	80.6	249.3	83.3	76.3
232			0.136	0.00	72.1	0.68	-	1.04	-0.01	80.4	248.6	83.4	76.0
233			0.137	0.00	72.1	0.68	-	1.04	-0.01	80.5	248.0	83.5	76.2
234			0.136	0.00	72.0	0.69	-	1.02	-0.02	80.3	246.8	83.7	75.3
235			0.136	0.00	72.0	0.69	-	1.01	-0.01	80.4	246.2	83.8	76.0
236			0.137	0.00	72.0	0.68	-	0.99	-0.01	80.3	245.5	83.9	75.7
237			0.138	0.00	72.0	0.68	-	0.98	-0.02	80.3	244.4	84.0	76.1
238			0.137	0.00	71.9	0.69	-	0.97	-0.01	80.2	243.8	84.1	75.7
239			0.136	0.00	72.0	0.68	-	0.96	-0.01	80.1	243.1	84.1	76.0
240	41.978	0.178	0.137	0.00	72.0	0.70	100	0.94	-0.02	80.2	242.1	84.1	76.0
241			0.137	0.00	71.9	0.68	-	0.93	0.00	80.1	241.9	84.1	76.2
242			0.136	0.00	71.9	0.68	-	0.91	-0.02	80.0	241.0	84.2	76.2
243			0.136	0.00	71.9	0.70	-	0.90	-0.01	80.0	240.1	84.3	76.1
244			0.138	0.00	71.8	0.68	-	0.88	-0.02	80.0	239.2	84.3	75.9
245			0.137	0.00	71.8	0.68	-	0.89	0.00	79.9	238.9	84.3	75.9
246			0.136	0.00	71.8	0.68	-	0.85	-0.03	79.8	238.0	84.4	75.5
247			0.137	0.00	71.7	0.69	-	0.84	-0.02	79.7	237.3	84.5	75.1
248			0.137	0.00	71.7	0.67	-	0.83	0.00	79.7	236.6	84.6	74.8
249			0.135	0.00	71.8	0.67	-	0.82	-0.01	79.9	236.1	84.6	74.7
250	43.757	0.178	0.137	0.00	71.7	0.67	100	0.80	-0.02	79.7	235.3	84.6	75.1
251			0.136	0.00	71.7	0.68	-	0.78	-0.01	79.7	234.6	84.7	75.1
252			0.136	0.00	71.6	0.69	-	0.77	-0.02	79.6	234.0	84.8	75.5
253			0.138	0.00	71.7	0.68	-	0.76	0.00	79.6	233.2	84.8	74.8
254			0.138	0.00	71.7	0.67	-	0.75	-0.01	79.5	232.8	84.8	74.5
255			0.138	0.00	71.6	0.68	-	0.73	-0.02	79.5	231.9	84.8	74.9
256			0.137	0.00	71.6	0.68	-	0.72	-0.01	79.5	231.6	84.8	74.5
257			0.138	0.00	71.7	0.67	-	0.70	-0.02	79.4	231.1	84.8	74.7
258			0.136	0.00	71.7	0.68	-	0.69	-0.01	79.4	230.4	84.9	75.2
259			0.138	0.00	71.7	0.69	-	0.68	-0.02	79.4	229.6	84.8	74.5
260	45.535	0.178	0.137	0.00	71.7	0.69	100	0.66	-0.02	79.4	228.7	84.7	74.7
261			0.137	0.00	71.7	0.68	-	0.65	-0.01	79.3	228.2	84.6	75.2
262			0.138	0.00	71.8	0.68	-	0.63	-0.02	79.3	227.7	84.5	75.3
263			0.137	0.00	71.8	0.68	-	0.63	0.00	79.2	227.1	84.4	74.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264			0.137	0.00	71.8	0.69	-	0.61	-0.02	79.2	226.4	84.3	75.2
265			0.136	0.00	71.7	0.69	-	0.60	-0.02	79.1	225.6	84.4	74.8
266			0.137	0.00	71.6	0.68	-	0.60	0.00	79.1	225.4	84.3	75.1
267			0.136	0.00	71.6	0.68	-	0.57	-0.03	79.0	224.6	84.4	74.5
268			0.136	0.00	71.5	0.69	-	0.56	-0.01	79.1	224.2	84.4	74.6
269			0.136	0.00	71.5	0.68	-	0.55	-0.01	79.1	223.8	84.3	74.8
270	47.324	0.179	0.137	0.00	71.5	0.68	100	0.54	-0.01	79.0	223.1	84.3	74.8
271			0.137	0.00	71.5	0.68	-	0.52	-0.01	78.9	222.7	84.3	75.0
272			0.137	0.00	71.5	0.68	-	0.51	-0.01	79.0	222.3	84.3	75.0
273			0.137	0.00	71.4	0.68	-	0.50	-0.01	78.9	222.1	84.2	75.0
274			0.137	0.00	71.4	0.68	-	0.49	-0.01	78.9	221.5	84.1	74.5
275			0.137	0.00	71.4	0.67	-	0.48	-0.01	78.9	221.0	84.2	75.2
276			0.137	0.00	71.5	0.68	-	0.46	-0.02	78.8	220.6	84.2	74.8
277			0.138	0.00	71.4	0.68	-	0.44	-0.01	78.8	220.2	84.1	75.2
278			0.137	0.00	71.4	0.69	-	0.43	-0.01	78.7	219.7	84.1	75.0
279			0.137	0.00	71.4	0.68	-	0.42	-0.01	78.7	219.3	84.1	74.9
280	49.101	0.178	0.136	0.00	71.5	0.69	100	0.41	-0.01	78.6	218.7	84.0	75.2
281			0.138	0.00	71.4	0.69	-	0.42	0.00	78.7	218.5	84.2	74.8
282			0.137	0.00	71.4	0.68	-	0.39	-0.03	78.5	217.5	84.1	75.1
283			0.136	0.00	71.4	0.69	-	0.38	-0.01	78.5	217.2	84.0	75.3
284			0.137	0.00	71.3	0.69	-	0.37	-0.02	78.4	216.6	84.0	73.8
285			0.138	0.00	71.3	0.67	-	0.36	-0.01	78.5	216.4	83.9	74.5
286			0.138	0.00	71.4	0.67	-	0.36	0.00	78.4	215.9	83.9	74.1
287			0.136	0.00	71.5	0.68	-	0.34	-0.02	78.4	215.2	83.9	74.1
288			0.137	0.00	71.4	0.68	-	0.32	-0.02	82.0	222.7	84.2	74.6
289			0.137	0.00	71.5	0.67	-	0.31	-0.01	79.3	217.9	84.0	74.6
290	50.883	0.178	0.136	0.00	71.6	0.69	100	0.30	-0.01	78.8	214.9	83.9	74.2
291			0.138	0.00	71.5	0.68	-	0.29	-0.01	78.5	212.9	83.9	74.4
292			0.136	0.00	71.5	0.67	-	0.28	-0.01	78.4	211.2	83.9	74.4
293			0.138	0.00	71.5	0.68	-	0.27	0.00	78.3	209.5	83.9	74.3
294			0.137	0.00	71.5	0.68	-	0.27	0.00	78.3	208.1	83.9	74.6
295			0.138	0.00	71.5	0.68	-	0.26	-0.01	78.2	206.8	83.8	74.2
296			0.137	0.00	71.4	0.68	-	0.25	-0.01	78.2	205.8	83.8	74.5

# BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297			0.136	0.00	71.4	0.69	-	0.24	-0.01	78.1	204.7	83.8	74.4
298			0.138	0.00	71.4	0.68	-	0.25	0.01	78.1	203.6	83.8	74.0
299			0.137	0.00	71.5	0.68	-	0.24	-0.01	78.0	202.7	83.8	74.1
300	52.663	0.178	0.137	0.00	71.5	0.68	100	0.23	-0.01	77.9	201.6	83.7	74.3
301			0.136	0.00	71.5	0.69	-	0.22	-0.01	78.0	200.6	83.8	74.7
302			0.137	0.00	71.4	0.69	-	0.22	0.00	77.8	199.4	83.8	74.5
303			0.136	0.00	71.5	0.69	-	0.22	0.00	77.9	198.6	83.8	74.8
304			0.137	0.00	71.4	0.69	-	0.21	0.00	77.7	197.4	83.7	74.3
305			0.138	0.00	71.5	0.68	-	0.20	-0.01	77.8	196.4	83.8	74.3
306			0.137	0.00	71.5	0.69	-	0.19	-0.02	77.7	195.8	83.7	74.2
307			0.136	0.00	71.5	0.68	-	0.20	0.01	77.7	194.7	83.8	74.3
308			0.136	0.00	71.6	0.69	-	0.18	-0.02	77.6	193.9	83.8	73.9
309			0.137	0.00	71.7	0.69	-	0.16	-0.01	77.6	192.9	83.7	73.9
310	54.452	0.179	0.137	0.00	71.7	0.68	100	0.16	0.00	77.5	192.3	83.5	74.1
311			0.137	0.00	71.5	0.68	-	0.16	-0.01	77.5	191.6	83.6	74.1
312			0.138	0.00	71.6	0.68	-	0.15	0.00	77.4	190.6	83.4	74.1
313			0.137	0.00	71.6	0.70	-	0.15	0.00	77.4	189.9	83.5	73.8
314			0.137	0.00	71.5	0.69	-	0.15	-0.01	77.4	189.0	83.3	73.9
315			0.138	0.00	71.6	0.68	-	0.14	0.00	77.2	188.4	83.2	74.0
316			0.137	0.00	71.6	0.68	-	0.14	-0.01	77.3	187.5	83.3	74.2
317			0.137	0.00	71.6	0.69	-	0.11	-0.02	77.2	186.9	83.2	73.8
318			0.138	0.00	71.5	0.68	-	0.13	0.01	77.1	186.2	83.2	73.9
319			0.137	0.00	71.5	0.69	-	0.11	-0.01	77.0	185.5	83.3	73.7
320	56.240	0.179	0.138	0.00	71.6	0.69	100	0.11	0.00	77.2	184.7	83.2	73.7
321			0.138	0.00	71.5	0.70	-	0.10	-0.01	77.0	183.9	83.1	73.7
322			0.137	0.00	71.5	0.69	-	0.09	-0.01	77.0	183.3	83.2	73.6
323			0.137	0.00	71.5	0.69	-	0.09	-0.01	77.0	182.3	83.2	73.7
324			0.136	0.00	71.5	0.69	-	0.08	-0.01	76.9	181.7	83.2	73.8
325			0.137	0.00	71.5	0.69	-	0.08	0.00	77.0	181.0	83.3	73.6
326			0.137	0.00	71.6	0.68	-	0.08	-0.01	76.8	180.4	83.2	73.8
327			0.137	0.00	71.6	0.69	-	0.08	0.00	76.9	179.7	83.3	73.7
328			0.137	0.00	71.6	0.70	-	0.07	-0.01	76.7	179.0	83.3	73.6
329			0.137	0.00	71.6	0.70	-	0.06	-0.01	76.8	178.3	83.3	73.8

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	58.027	0.179	0.137	0.00	71.6	0.70	100	0.06	0.00	76.7	177.7	83.2	73.5
331			0.138	0.00	71.7	0.68	-	0.05	-0.01	76.7	177.0	83.3	73.6
332			0.138	0.00	71.7	0.70	-	0.05	0.00	76.5	176.2	83.3	73.6
333			0.138	0.00	71.8	0.69	-	0.04	-0.01	76.5	175.6	83.3	73.7
334			0.138	0.00	71.7	0.69	-	0.04	0.00	76.5	174.9	83.3	73.5
335			0.138	0.00	71.7	0.69	-	0.04	0.00	76.4	174.1	83.3	73.5
336			0.139	0.00	71.7	0.69	-	0.03	0.00	76.4	173.4	83.2	73.5
337			0.138	0.00	71.7	0.69	-	0.02	-0.01	76.3	172.7	83.2	73.4
338			0.138	0.00	71.7	0.69	-	0.02	0.00	76.3	171.7	83.3	73.3
339			0.138	0.00	71.6	0.70	-	0.02	0.00	76.3	171.3	83.3	73.1
340	59.815	0.179	0.137	0.00	71.6	0.71	100	0.01	-0.01	76.2	170.6	83.3	73.0
341			0.138	0.00	71.6	0.69	-	0.00	-0.01	76.2	170.0	83.3	73.5
342	60.183	0.184	0.139	0.00	71.6	0.70	105	0.00	0.00	76.2	169.9	83.3	73.5
Avg/Tot	60.183	0.176	0.135	0.00	72.6	0.57	100			87.2	323.3	84.0	77.6

Data from 12/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	72.9	0.45		82.7	-0.069	2.32	0.065	9.7	49.1
1			0.00	72.9	0.41	-	81.8	-0.078	2.16	0.152	11.9	53.8
2			0.00	72.9	0.42	-	81.5	-0.091	3.42	0.150	14.0	56.8
3			0.00	72.9	0.49	-	81.3	-0.091	4.95	0.340	14.3	59.7
4			0.00	72.9	0.48	-	80.3	-0.093	12.91	0.338	13.9	58.6
5			0.00	72.8	0.42	-	80.5	-0.095	12.39	0.183	18.1	60.6
6			0.00	72.9	0.46	-	80.7	-0.095	12.91	0.287	18.5	60.6
7			0.00	73.0	0.48	-	81.1	-0.095	12.63	0.189	19.3	59.4
8			0.00	73.0	0.49	-	81.9	-0.095	13.67	0.305	19.2	59.4
9			0.00	73.0	0.50	-	83.3	-0.095	13.43	0.232	20.7	58.8
10	1.756	0.176	0.00	73.0	0.43	104	84.8	-0.093	12.37	0.168	21.3	57.4
11			0.00	73.0	0.41	-	86.0	-0.093	11.45	0.126	21.0	56.8
12			0.00	73.0	0.45	-	86.4	-0.092	11.18	0.107	19.7	57.6
13			0.00	73.0	0.43	-	86.8	-0.094	11.19	0.106	19.3	57.4
14			0.00	73.0	0.42	-	87.2	-0.094	10.97	0.135	19.4	58.5
15			0.00	73.0	0.51	-	86.8	-0.095	12.81	0.575	18.6	58.6
16			0.00	73.0	0.41	-	86.2	-0.090	14.66	0.430	19.5	58.8
17			0.00	73.1	0.4	-	85.6	-0.089	13.51	0.221	20.3	57.7
18			0.00	73.0	0.47	-	85.0	-0.086	11.67	0.119	21.1	55.6
19			0.00	73.0	0.48	-	84.6	-0.084	9.49	0.260	21.4	53.6
20	3.479	0.172	0.00	72.9	0.44	100	84.4	-0.082	7.84	0.387	20.8	52.9
21			0.00	72.9	0.46	-	84.2	-0.078	7.23	0.473	19.7	52.7
22			0.00	72.9	0.45	-	83.9	-0.077	7.06	0.505	19.0	52.3
23			0.00	72.9	0.44	-	83.6	-0.077	7.01	0.516	18.8	51.8
24			0.00	72.9	0.48	-	83.4	-0.075	6.92	0.528	18.7	51.3
25			0.00	72.9	0.49	-	83.0	-0.073	6.84	0.548	18.8	50.9
26			0.00	72.8	0.45	-	82.5	-0.073	5.98	0.704	19.7	49.5
27			0.00	72.8	0.45	-	82.3	-0.073	6.06	0.673	20.8	48.6
28			0.00	72.8	0.41	-	82.2	-0.074	6.37	0.613	20.6	49.3
29			0.00	72.8	0.49	-	82.2	-0.076	8.24	0.431	19.7	50.0
30	5.200	0.172	0.00	72.8	0.50	100	82.2	-0.077	9.23	0.361	19.8	50.9
31			0.00	72.8	0.50	-	82.1	-0.078	9.59	0.314	19.8	51.1
32			0.00	72.8	0.41	-	82.1	-0.079	10.43	0.284	20.0	51.3
33			0.00	72.8	0.47	-	82.0	-0.079	10.95	0.259	20.1	51.6
34			0.00	72.8	0.50	-	82.0	-0.081	11.35	0.239	20.2	51.8
35			0.00	72.7	0.46	-	82.3	-0.081	11.75	0.218	20.4	52.2
36			0.00	72.7	0.50	-	82.7	-0.082	11.96	0.241	20.5	52.3
37			0.00	72.7	0.49	-	83.1	-0.082	12.14	0.246	20.5	52.5
38			0.00	72.7	0.48	-	83.4	-0.082	12.16	0.305	20.5	53.1

Data from 12/19/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	72.7	0.42	-	83.7	-0.082	12.27	0.313	20.4	52.7
40	6.920	0.172	0.00	72.7	0.45	99	83.9	-0.082	12.36	0.264	20.7	52.7
41			0.00	72.8	0.51	-	84.2	-0.083	12.42	0.215	20.8	52.5
42			0.00	72.8	0.49	-	84.3	-0.083	12.52	0.229	21.6	52.2
43			0.00	72.8	0.44	-	84.5	-0.083	12.50	0.182	22.2	52.2
44			0.00	72.9	0.47	-	84.6	-0.083	12.64	0.139	22.3	51.8
45			0.00	72.9	0.50	-	84.8	-0.084	12.85	0.112	22.4	51.8
46			0.00	72.9	0.46	-	84.9	-0.083	12.87	0.145	22.6	51.6
47			0.00	72.9	0.48	-	85.0	-0.084	12.98	0.125	22.8	51.8
48			0.00	72.9	0.45	-	85.1	-0.084	12.93	0.155	22.9	51.8
49			0.00	72.9	0.43	-	85.2	-0.085	13.03	0.207	22.8	51.6
50	8.647	0.173	0.00	72.9	0.44	99	85.3	-0.085	13.22	0.244	22.9	51.8
51			0.00	73.0	0.50	-	85.5	-0.084	13.13	0.244	23.1	51.8
52			0.00	72.9	0.49	-	85.6	-0.085	12.93	0.217	23.0	51.8
53			0.00	72.9	0.45	-	85.8	-0.085	13.00	0.152	22.9	51.4
54			0.00	72.9	0.48	-	85.9	-0.085	12.98	0.179	22.8	51.4
55			0.00	72.8	0.44	-	85.9	-0.084	11.00	0.122	22.8	51.4
56			0.00	72.9	0.44	-	86.1	-0.084	13.08	0.115	22.9	51.4
57			0.00	72.9	0.49	-	86.1	-0.085	13.20	0.114	22.9	51.3
58			0.00	72.9	0.49	-	86.2	-0.084	13.35	0.155	22.9	51.3
59			0.00	72.9	0.51	-	86.4	-0.083	13.50	0.158	23.0	51.3
60	10.366	0.172	0.00	72.9	0.49	98	86.6	-0.083	13.37	0.162	23.1	51.3
61			0.00	72.9	0.46	-	86.7	-0.084	13.33	0.161	23.1	51.3
62			0.00	72.9	0.43	-	86.7	-0.082	13.29	0.179	23.1	51.3
63			0.00	73.0	0.48	-	86.8	-0.082	13.42	0.207	23.1	51.1
64			0.00	72.9	0.45	-	86.8	-0.082	13.44	0.129	23.3	51.3
65			0.00	72.9	0.44	-	86.8	-0.083	13.57	0.138	23.3	51.1
66			0.00	72.8	0.45	-	86.7	-0.083	13.40	0.158	23.3	51.1
67			0.00	72.9	0.44	-	86.7	-0.083	13.81	0.116	23.3	50.9
68			0.00	72.9	0.51	-	86.6	-0.084	13.67	0.108	23.3	50.7
69			0.00	72.9	0.48	-	86.6	-0.082	13.75	0.123	23.3	50.7
70	12.082	0.172	0.00	73.0	0.47	98	86.5	-0.083	13.60	0.130	23.3	50.5
71			0.00	73.0	0.45	-	86.4	-0.083	13.58	0.104	23.2	50.5
72			0.00	73.0	0.52	-	86.3	-0.082	13.78	0.092	23.2	50.5
73			0.00	73.0	0.50	-	86.3	-0.083	13.76	0.064	23.2	50.5
74			0.00	73.0	0.51	-	86.1	-0.083	13.60	0.106	23.2	50.4
75			0.00	73.0	0.51	-	86.0	-0.083	13.70	0.088	23.1	50.4
76			0.00	73.0	0.46	-	85.9	-0.084	13.87	0.106	23.1	50.2
77			0.00	73.0	0.51	-	85.7	-0.083	14.16	0.087	23.2	50.4

Data from 12/19/2022 testing - Reference Only



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	73.0	0.53	-	85.5	-0.086	14.29	0.082	23.2	50.4
79			0.00	73.0	0.45	-	85.4	-0.084	14.41	0.102	23.2	50.4
80	13.804	0.172	0.00	72.9	0.54	98	85.3	-0.085	14.67	0.126	23.2	50.4
81			0.00	72.9	0.53	-	85.3	-0.083	14.63	0.070	23.2	50.4
82			0.00	72.9	0.49	-	85.1	-0.084	14.56	0.073	23.1	50.4
83			0.00	72.9	0.50	-	85.0	-0.085	14.70	0.143	23.2	50.4
84			0.00	72.9	0.57	-	85.0	-0.085	14.93	0.133	23.2	50.4
85			0.00	72.9	0.61	-	84.8	-0.085	14.89	0.164	23.1	50.4
86			0.00	72.9	0.61	-	84.7	-0.086	15.02	0.190	23.0	50.4
87			0.00	72.9	0.72	-	84.6	-0.086	15.03	0.249	23.0	50.4
88			0.00	72.9	0.75	-	84.4	-0.085	15.17	0.226	23.0	50.4
89			0.00	72.9	0.78	-	84.4	-0.086	15.16	0.280	23.0	50.5
90	15.512	0.171	0.00	72.9	0.79	97	83.8	-0.086	15.16	0.282	22.8	50.5
91			0.00	72.9	0.82	-	83.6	-0.085	14.55	0.163	22.7	50.4
92			0.00	72.9	0.82	-	83.3	-0.084	13.99	0.167	22.6	50.0
93			0.00	72.9	0.83	-	83.0	-0.084	13.79	0.172	22.4	49.6
94			0.00	72.9	0.82	-	82.7	-0.083	13.82	0.113	22.2	49.3
95			0.00	72.9	0.81	-	82.5	-0.084	13.64	0.150	22.2	49.3
96			0.00	72.9	0.87	-	82.3	-0.083	13.24	0.132	22.2	49.1
97			0.00	72.9	0.84	-	82.1	-0.082	13.13	0.128	22.1	48.7
98			0.00	72.9	0.90	-	81.9	-0.083	12.91	0.117	22.1	48.7
99			0.00	72.8	0.91	-	82.2	-0.083	12.98	0.067	22.1	48.4
100	17.236	0.172	0.00	72.9	0.85	99	82.7	-0.084	12.90	0.122	21.8	48.4
101			0.00	72.9	0.85	-	83.2	-0.082	12.79	0.081	21.6	48.2
102			0.00	72.9	0.91	-	83.6	-0.082	12.67	0.089	21.4	48.0
103			0.00	72.9	0.96	-	84.1	-0.082	12.34	0.062	21.4	47.8
104			0.00	72.9	0.94	-	84.5	-0.079	11.53	0.010	21.3	47.7
105			0.00	72.9	0.96	-	84.9	-0.080	10.79	0.045	21.0	47.1
106			0.00	72.8	0.90	-	85.3	-0.079	10.39	0.029	20.7	46.6
107			0.00	72.8	0.96	-	85.6	-0.079	10.00	0.081	20.5	46.2
108			0.00	72.8	0.88	-	86.0	-0.078	9.85	0.069	20.5	45.9
109			0.00	72.8	0.88	-	86.1	-0.077	9.44	0.069	20.4	45.7
110	18.973	0.174	0.00	72.8	0.93	99	86.4	-0.075	8.95	0.084	20.3	45.5
111			0.00	72.8	0.90	-	86.6	-0.075	8.72	0.102	20.3	45.0
112			0.00	72.8	0.93	-	86.9	-0.074	8.68	0.113	20.3	44.8
113			0.00	72.8	0.95	-	87.0	-0.073	8.72	0.096	20.4	44.6
114			0.00	72.8	0.94	-	87.3	-0.073	8.64	0.114	20.4	44.2
115			0.00	72.8	0.90	-	87.5	-0.072	8.59	0.113	20.4	44.1
116			0.00	72.8	0.95	-	87.8	-0.072	8.55	0.127	20.4	44.1

Data from 12/19/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.00	72.9	0.89	-	87.8	-0.071	8.55	0.108	20.5	43.9
118			0.00	72.8	0.89	-	87.9	-0.071	8.54	0.091	20.5	43.9
119			0.00	72.8	0.89	-	87.5	-0.070	8.55	0.091	20.5	43.7
120	20.734	0.176	0.00	72.8	0.93	100	87.0	-0.070	8.51	0.089	20.5	43.5
121			0.00	72.7	0.90	-	86.6	-0.069	8.54	0.082	20.5	43.3
122			0.00	72.7	0.94	-	86.2	-0.069	8.57	0.078	20.5	43.3
123			0.00	72.7	0.93	-	85.8	-0.068	8.56	0.083	20.6	43.2
124			0.00	72.7	0.93	-	85.4	-0.069	8.57	0.075	20.6	43.2
125			0.00	72.7	0.88	-	84.9	-0.069	8.55	0.064	20.6	43.0
126			0.00	72.7	0.88	-	84.4	-0.068	8.55	0.075	20.6	42.8
127			0.00	72.7	0.92	-	84.0	-0.068	8.59	0.066	20.6	42.8
128			0.00	72.7	0.93	-	83.5	-0.068	8.52	0.064	20.6	42.6
129			0.00	72.8	0.93	-	83.1	-0.067	8.46	0.078	20.6	42.4
130	22.506	0.177	0.00	72.7	0.88	100	82.7	-0.067	8.45	0.076	20.6	42.4
131			0.00	72.7	0.86	-	82.4	-0.066	8.33	0.073	20.6	42.3
132			0.00	72.7	0.86	-	82.0	-0.065	8.10	0.084	20.5	42.1
133			0.00	72.6	0.93	-	81.7	-0.065	7.83	0.111	20.4	41.7
134			0.00	72.6	0.87	-	81.4	-0.064	7.78	0.132	20.3	41.4
135			0.00	72.6	0.85	-	81.4	-0.064	7.70	0.152	20.3	41.2
136			0.00	72.6	0.86	-	81.4	-0.064	7.54	0.193	20.2	41.0
137			0.00	72.6	0.91	-	81.4	-0.063	7.53	0.202	20.3	41.0
138			0.00	72.6	0.86	-	81.5	-0.063	7.57	0.192	20.3	40.8
139			0.00	72.7	0.85	-	81.5	-0.063	7.61	0.187	20.3	40.8
140	24.277	0.177	0.00	72.6	0.85	101	81.5	-0.062	7.55	0.194	20.3	40.8
141			0.00	72.5	0.85	-	81.5	-0.062	7.54	0.176	20.3	40.6
142			0.00	72.5	0.92	-	81.5	-0.062	7.54	0.197	20.4	40.6
143			0.00	72.5	0.89	-	81.6	-0.061	7.57	0.181	20.4	40.5
144			0.00	72.4	0.84	-	81.7	-0.061	7.54	0.200	20.4	40.3
145			0.00	72.4	0.87	-	81.8	-0.061	7.51	0.191	20.4	40.3
146			0.00	72.4	0.84	-	81.9	-0.060	7.54	0.206	20.5	40.1
147			0.00	72.4	0.92	-	82.0	-0.060	7.47	0.225	20.5	40.1
148			0.00	72.4	0.84	-	82.3	-0.059	7.48	0.227	20.5	40.1
149			0.00	72.4	0.91	-	82.4	-0.059	7.45	0.239	20.5	39.9
150	26.047	0.177	0.00	72.4	0.89	100	82.6	-0.059	7.44	0.238	20.5	39.9
151			0.00	72.4	0.84	-	82.7	-0.059	7.44	0.244	20.5	39.7
152			0.00	72.4	0.90	-	82.8	-0.059	7.42	0.259	20.6	39.7
153			0.00	72.3	0.91	-	82.9	-0.058	7.41	0.267	20.6	39.7
154			0.00	72.3	0.86	-	83.0	-0.058	7.42	0.264	20.6	39.6
155			0.00	72.4	0.87	-	83.2	-0.058	7.40	0.282	20.6	39.6

Data from 12/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
156			0.00	72.4	0.85	-	83.2	-0.058	7.38	0.289	20.6	39.4
157			0.00	72.4	0.87	-	83.3	-0.058	7.45	0.288	20.6	39.4
158			0.00	72.5	0.87	-	83.4	-0.057	7.53	0.285	20.6	39.4
159			0.00	72.5	0.92	-	83.5	-0.057	7.52	0.282	20.6	39.4
160	27.814	0.177	0.00	72.5	0.84	100	83.6	-0.057	7.49	0.288	20.7	39.2
161			0.00	72.4	0.92	-	83.7	-0.057	7.51	0.287	20.7	39.2
162			0.00	72.3	0.83	-	83.9	-0.057	7.51	0.287	20.7	39.2
163			0.00	72.2	0.87	-	84.1	-0.057	7.55	0.284	20.7	39.2
164			0.00	72.2	0.89	-	84.3	-0.057	7.37	0.256	20.8	39.2
165			0.00	72.1	0.91	-	84.5	-0.056	7.39	0.246	20.8	39.2
166			0.00	72.1	0.91	-	84.7	-0.057	7.46	0.247	20.8	39.0
167			0.00	72.0	0.93	-	84.8	-0.055	7.41	0.247	20.8	39.0
168			0.00	72.1	0.91	-	85.0	-0.055	7.46	0.251	20.9	39.0
169			0.00	72.1	0.85	-	85.1	-0.055	7.28	0.279	20.8	39.0
170	29.580	0.177	0.00	72.2	0.93	99	85.2	-0.055	7.31	0.284	20.8	38.8
171			0.00	72.2	0.95	-	85.3	-0.055	7.26	0.281	20.8	38.8
172			0.00	72.2	0.89	-	85.5	-0.055	7.26	0.288	20.8	38.8
173			0.00	72.1	0.88	-	85.6	-0.054	7.24	0.289	20.9	38.7
174			0.00	72.1	0.89	-	85.7	-0.054	7.20	0.290	20.8	38.7
175			0.00	72.0	0.94	-	85.8	-0.054	7.35	0.314	20.9	38.7
176			0.00	72.0	0.87	-	85.9	-0.054	7.23	0.307	20.9	38.7
177			0.00	72.0	0.92	-	85.9	-0.053	7.23	0.308	20.9	38.7
178			0.00	72.1	0.93	-	86.0	-0.054	7.25	0.309	20.9	38.5
179			0.00	72.1	0.90	-	86.0	-0.054	7.24	0.319	20.9	38.5
180	31.370	0.179	0.00	72.1	0.86	101	85.9	-0.053	7.27	0.315	21.0	38.5
181			0.00	72.2	0.91	-	85.8	-0.053	7.30	0.338	21.0	38.5
182			0.00	72.2	0.93	-	85.8	-0.053	7.36	0.347	21.0	38.5
183			0.00	72.2	0.91	-	85.7	-0.053	7.27	0.346	21.1	38.5
184			0.00	72.2	0.88	-	85.7	-0.053	7.00	0.352	21.1	38.5
185			0.00	72.2	0.93	-	85.6	-0.052	7.06	0.360	21.0	38.5
186			0.00	72.2	0.89	-	85.5	-0.053	6.95	0.353	21.1	38.5
187			0.00	72.2	0.86	-	85.4	-0.052	7.12	0.365	21.1	38.3
188			0.00	72.2	0.90	-	85.2	-0.052	7.14	0.364	21.1	38.3
189			0.00	72.3	0.86	-	85.0	-0.052	6.94	0.353	21.1	38.3
190	33.163	0.179	0.00	72.2	0.86	101	84.8	-0.052	7.10	0.361	21.1	38.3
191			0.00	72.2	0.91	-	84.7	-0.052	6.94	0.351	21.2	38.3
192			0.00	72.2	0.93	-	84.5	-0.051	7.10	0.361	21.2	38.3
193			0.00	72.2	0.88	-	84.4	-0.051	6.95	0.354	21.3	38.3
194			0.00	72.1	0.89	-	84.3	-0.051	6.90	0.348	21.3	38.3

Data from 12/19/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
195			0.00	72.1	0.91	-	84.1	-0.051	7.09	0.364	21.3	38.3
196			0.00	72.0	0.92	-	84.0	-0.051	7.10	0.364	21.3	38.3
197			0.00	72.0	0.86	-	83.9	-0.051	7.07	0.365	21.4	38.1
198			0.00	72.0	0.85	-	83.8	-0.051	7.06	0.364	21.4	38.3
199			0.00	72.1	0.87	-	83.8	-0.051	7.07	0.369	21.4	38.1
200	34.956	0.179	0.00	72.0	0.86	101	83.4	-0.050	6.88	0.365	21.4	38.1
201			0.00	71.9	0.88	-	83.1	-0.051	6.84	0.366	21.4	38.1
202			0.00	71.9	0.91	-	82.9	-0.050	6.75	0.363	21.4	38.1
203			0.00	71.8	0.90	-	82.6	-0.050	6.84	0.369	21.4	38.1
204			0.00	71.7	0.92	-	82.4	-0.050	6.66	0.334	21.4	38.1
205			0.00	71.7	0.88	-	82.1	-0.050	6.66	0.331	21.5	38.1
206			0.00	71.5	0.85	-	81.8	-0.050	6.65	0.337	21.6	37.9
207			0.00	71.5	0.90	-	81.7	-0.050	6.66	0.342	21.6	37.9
208			0.00	71.5	0.91	-	82.2	-0.050	6.62	0.346	21.6	37.9
209			0.00	71.5	0.90	-	83.0	-0.050	6.59	0.351	21.5	37.9
210	36.757	0.180	0.00	71.5	0.87	101	83.7	-0.050	6.56	0.359	21.6	37.9
211			0.00	71.5	0.86	-	84.4	-0.050	6.52	0.362	21.6	37.9
212			0.00	71.6	0.88	-	85.0	-0.050	6.51	0.367	21.6	37.8
213			0.00	71.5	0.93	-	85.6	-0.050	6.48	0.373	21.6	37.8
214			0.00	71.5	0.86	-	86.2	-0.049	6.44	0.383	21.6	37.8
215			0.00	71.5	0.87	-	86.7	-0.049	6.38	0.385	21.6	37.8
216			0.00	71.4	0.87	-	87.3	-0.049	6.39	0.388	21.7	37.8
217			0.00	71.4	0.91	-	87.4	-0.049	6.33	0.387	21.7	37.8
218			0.00	71.5	0.92	-	87.2	-0.049	6.34	0.394	21.7	37.8
219			0.00	71.5	0.92	-	86.9	-0.049	6.32	0.394	21.7	37.8
220	38.553	0.180	0.00	71.5	0.90	101	86.6	-0.049	6.34	0.402	21.7	37.6
221			0.00	71.5	0.92	-	86.4	-0.048	6.31	0.399	21.7	37.6
222			0.00	71.4	0.92	-	86.2	-0.049	6.24	0.398	21.7	37.6
223			0.00	71.4	0.86	-	85.9	-0.048	6.25	0.398	21.8	37.6
224			0.00	71.4	0.90	-	85.7	-0.048	6.24	0.403	21.8	37.6
225			0.00	71.4	0.85	-	85.5	-0.048	6.17	0.400	21.8	37.6
226			0.00	71.4	0.93	-	85.3	-0.048	6.15	0.400	21.8	37.6
227			0.00	71.5	0.93	-	85.1	-0.048	5.89	0.388	21.9	37.6
228			0.00	71.5	0.92	-	84.9	-0.048	5.90	0.382	21.8	37.6
229			0.00	71.5	0.91	-	84.7	-0.047	5.67	0.357	21.9	37.6
230	40.348	0.180	0.00	71.5	0.88	101	84.5	-0.047	5.67	0.361	22.0	37.6
231			0.00	71.5	0.86	-	84.2	-0.047	5.66	0.364	22.0	37.6
232			0.00	71.6	0.87	-	84.0	-0.047	5.66	0.368	22.0	37.6
233			0.00	71.6	0.85	-	83.8	-0.047	5.61	0.364	22.1	37.6

Data from 12/19/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
234			0.00	71.5	0.89	-	83.6	-0.046	5.59	0.369	22.0	37.6
235			0.00	71.5	0.92	-	83.3	-0.046	5.61	0.373	22.1	37.6
236			0.00	71.5	0.93	-	83.2	-0.046	5.60	0.374	22.1	37.6
237			0.00	71.5	0.91	-	83.0	-0.046	5.55	0.369	22.1	37.6
238			0.00	71.5	0.91	-	82.8	-0.046	5.57	0.373	22.2	37.6
239			0.00	71.5	0.90	-	82.6	-0.046	5.54	0.374	22.2	37.6
240	42.138	0.179	0.00	71.5	0.87	100	82.4	-0.046	5.52	0.370	22.3	37.6
241			0.00	71.4	0.88	-	82.3	-0.046	5.49	0.370	22.3	37.6
242			0.00	71.4	0.90	-	82.1	-0.046	5.46	0.370	22.3	37.6
243			0.00	71.4	0.92	-	82.0	-0.046	5.44	0.369	22.3	37.6
244			0.00	71.4	0.86	-	81.9	-0.046	5.46	0.375	22.3	37.6
245			0.00	71.4	0.88	-	81.8	-0.045	5.45	0.372	22.4	37.6
246			0.00	71.3	0.91	-	81.7	-0.045	5.44	0.369	22.3	37.6
247			0.00	71.3	0.90	-	81.6	-0.045	5.43	0.369	22.4	37.4
248			0.00	71.3	0.91	-	81.4	-0.045	5.41	0.369	22.5	37.4
249			0.00	71.3	0.92	-	81.4	-0.044	5.38	0.365	22.5	37.4
250	43.933	0.179	0.00	71.2	0.86	100	81.3	-0.044	5.41	0.368	22.4	37.6
251			0.00	71.2	0.91	-	81.2	-0.044	5.38	0.363	22.4	37.4
252			0.00	71.2	0.89	-	81.2	-0.044	5.36	0.360	22.5	37.4
253			0.00	71.2	0.85	-	81.1	-0.044	5.35	0.360	22.5	37.4
254			0.00	71.2	0.86	-	81.0	-0.044	5.34	0.359	22.6	37.4
255			0.00	71.1	0.86	-	80.9	-0.044	5.32	0.357	22.6	37.4
256			0.00	71.1	0.88	-	80.7	-0.044	5.33	0.359	22.6	37.4
257			0.00	71.2	0.92	-	80.7	-0.043	5.36	0.360	22.7	37.4
258			0.00	71.2	0.92	-	80.8	-0.043	5.31	0.356	22.7	37.4
259			0.00	71.2	0.93	-	81.9	-0.042	5.28	0.359	22.7	37.4
260	45.725	0.179	0.00	71.3	0.87	100	83.1	-0.043	5.24	0.356	22.7	37.4
261			0.00	71.3	0.89	-	84.2	-0.043	5.26	0.358	22.8	37.4
262			0.00	71.4	0.89	-	85.2	-0.043	5.24	0.355	22.8	37.4
263			0.00	71.3	0.90	-	86.0	-0.043	5.23	0.354	22.8	37.4
264			0.00	71.3	0.93	-	87.0	-0.042	5.24	0.355	22.8	37.4
265			0.00	71.3	0.95	-	87.8	-0.042	5.24	0.354	22.9	37.4
266			0.00	71.2	0.91	-	88.5	-0.042	5.24	0.355	22.9	37.4
267			0.00	71.2	0.87	-	89.3	-0.042	5.22	0.353	22.9	37.4
268			0.00	71.1	0.87	-	89.6	-0.042	5.23	0.353	23.0	37.4
269			0.00	71.1	0.92	-	89.0	-0.042	5.22	0.352	22.9	37.4
270	47.523	0.180	0.00	71.1	0.88	100	88.2	-0.042	5.19	0.348	22.9	37.4
271			0.00	71.0	0.92	-	87.6	-0.042	5.19	0.350	23.0	37.4
272			0.00	71.0	0.87	-	87.0	-0.041	5.16	0.349	23.0	37.4

Data from 12/19/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
273			0.00	70.9	0.86	-	86.5	-0.042	5.15	0.350	23.0	37.4
274			0.00	71.0	0.86	-	86.1	-0.041	5.11	0.347	23.1	37.4
275			0.00	70.9	0.88	-	85.7	-0.041	5.06	0.342	23.1	37.4
276			0.00	71.0	0.94	-	85.2	-0.041	5.02	0.339	23.1	37.4
277			0.00	71.0	0.90	-	84.9	-0.041	5.06	0.346	23.1	37.4
278			0.00	70.9	0.87	-	84.6	-0.041	5.06	0.344	23.1	37.4
279			0.00	70.9	0.87	-	84.3	-0.041	4.99	0.345	23.2	37.4
280	49.303	0.178	0.00	70.9	0.93	100	84.0	-0.041	4.98	0.345	23.2	37.4
281			0.00	70.9	0.88	-	83.7	-0.041	4.97	0.344	23.2	37.2
282			0.00	71.0	0.85	-	83.4	-0.041	4.97	0.343	23.2	37.4
283			0.00	70.9	0.87	-	83.2	-0.040	4.95	0.341	23.3	37.2
284			0.00	70.8	0.93	-	82.9	-0.040	4.95	0.341	23.2	37.2
285			0.00	70.8	0.86	-	82.6	-0.040	4.94	0.337	23.3	37.2
286			0.00	70.7	0.86	-	82.3	-0.040	4.89	0.332	23.3	37.4
287			0.00	70.8	0.92	-	82.1	-0.040	4.90	0.332	23.3	37.2
288			0.00	70.8	0.92	-	82.3	-0.040	2.04	0.179	23.4	37.4
289			0.00	70.8	0.90	-	82.0	-0.040	4.42	0.560	20.5	38.1
290	51.094	0.179	0.00	70.9	0.99	101	82.1	-0.040	4.08	0.474	22.9	37.6
291			0.00	70.9	0.94	-	82.8	-0.040	3.94	0.454	23.1	37.4
292			0.00	70.9	0.93	-	83.5	-0.039	3.80	0.435	23.2	37.4
293			0.00	70.9	0.92	-	84.2	-0.039	3.69	0.423	23.4	37.4
294			0.00	70.9	0.94	-	84.8	-0.039	3.63	0.418	23.4	37.2
295			0.00	70.9	0.93	-	85.3	-0.039	3.56	0.410	23.4	37.2
296			0.00	70.9	0.89	-	85.9	-0.039	3.50	0.404	23.5	37.2
297			0.00	70.9	0.91	-	86.4	-0.039	3.46	0.399	23.5	37.2
298			0.00	70.9	0.91	-	87.0	-0.038	3.41	0.398	23.5	37.2
299			0.00	70.9	0.87	-	87.4	-0.038	3.36	0.390	23.5	37.2
300	52.882	0.179	0.00	71.0	0.88	100	87.8	-0.038	3.32	0.385	23.6	37.2
301			0.00	71.0	0.90	-	88.2	-0.038	3.27	0.379	23.6	37.2
302			0.00	70.9	0.89	-	88.5	-0.037	3.26	0.381	23.6	37.2
303			0.00	70.9	0.92	-	88.8	-0.036	3.22	0.374	23.6	37.2
304			0.00	70.9	0.95	-	89.1	-0.037	3.21	0.377	23.6	37.2
305			0.00	70.8	0.95	-	89.3	-0.036	3.18	0.368	23.7	37.2
306			0.00	70.8	0.95	-	89.4	-0.036	3.16	0.366	23.7	37.2
307			0.00	70.8	0.93	-	87.3	-0.036	3.14	0.362	23.8	37.2
308			0.00	71.0	0.91	-	85.9	-0.036	3.12	0.360	23.8	37.2
309			0.00	71.0	0.90	-	85.3	-0.035	3.11	0.360	23.8	37.2
310	54.669	0.179	0.00	71.0	0.88	100	84.8	-0.036	3.11	0.361	23.9	37.2
311			0.00	70.9	0.87	-	84.2	-0.035	3.09	0.358	23.9	37.2

Data from 12/19/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
312			0.00	71.0	0.91	-	83.7	-0.035	3.10	0.360	23.9	37.2
313			0.00	71.0	0.91	-	83.2	-0.035	3.05	0.352	23.9	37.2
314			0.00	71.0	0.92	-	82.7	-0.034	3.06	0.354	24.0	37.2
315			0.00	71.0	0.92	-	82.3	-0.034	3.03	0.346	24.0	37.0
316			0.00	71.0	0.94	-	82.0	-0.034	3.03	0.345	24.0	37.0
317			0.00	71.0	0.87	-	81.9	-0.034	3.03	0.344	24.0	37.0
318			0.00	71.0	0.92	-	81.8	-0.034	2.99	0.338	24.1	37.0
319			0.00	71.0	0.92	-	81.7	-0.034	2.97	0.333	24.1	37.0
320	56.463	0.179	0.00	71.0	0.87	100	81.8	-0.034	3.01	0.343	24.2	37.0
321			0.00	70.9	0.88	-	81.7	-0.034	2.97	0.336	24.1	37.0
322			0.00	70.9	0.92	-	81.7	-0.034	2.96	0.329	24.2	37.0
323			0.00	70.9	0.88	-	81.7	-0.034	2.96	0.331	24.2	37.0
324			0.00	70.9	0.94	-	81.7	-0.033	2.93	0.327	24.3	37.0
325			0.00	70.9	0.88	-	81.7	-0.033	2.91	0.323	24.2	37.0
326			0.00	71.0	0.92	-	82.0	-0.033	2.90	0.322	24.2	37.0
327			0.00	71.0	0.93	-	83.0	-0.032	2.89	0.321	24.3	37.0
328			0.00	71.0	0.92	-	83.9	-0.032	2.88	0.318	24.3	37.0
329			0.00	71.0	0.88	-	84.8	-0.032	2.88	0.321	24.3	37.0
330	58.253	0.179	0.00	71.0	0.94	100	85.7	-0.032	2.86	0.319	24.3	37.0
331			0.00	71.1	0.87	-	86.5	-0.032	2.83	0.312	24.4	37.0
332			0.00	71.1	0.93	-	87.3	-0.032	2.77	0.307	24.4	37.0
333			0.00	71.1	0.88	-	88.0	-0.031	2.77	0.309	24.5	37.0
334			0.00	71.2	0.92	-	88.6	-0.032	2.67	0.296	24.5	37.0
335			0.00	71.1	0.89	-	89.3	-0.031	2.69	0.301	24.5	37.0
336			0.00	71.0	0.91	-	86.5	-0.031	2.67	0.295	24.5	37.0
337			0.00	71.0	0.91	-	81.8	-0.031	2.64	0.290	24.6	37.0
338			0.00	71.0	0.91	-	84.2	-0.031	2.64	0.290	24.7	37.0
339			0.00	71.0	0.93	-	83.7	-0.030	2.62	0.284	24.7	37.0
340	60.044	0.179	0.00	71.0	0.87	100	83.2	-0.030	2.62	0.286	24.7	37.0
341			0.00	71.0	0.89	-	82.7	-0.030	2.62	0.285	24.7	37.0
342	60.416	0.186	0.00	70.9	106.00	106	82.3	-0.030	2.63	0.286	24.8	37.0
Avg/Tot	60.416	0.177	0.00	72.0	1.09	100	84.3	-0.060	7.81	0.275	21.82	42.779

Data from 12/19/2022 testing - Reference only

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	73.7	0.23		86.6
1			0.00	73.7	0.24	-	86.3
2			0.00	73.7	0.23		86.5
3			0.00	73.7	0.24	-	86.7
4			0.00	73.7	0.23	-	86.0
5			0.00	73.7	0.23	-	85.6
6			0.00	73.7	0.24	-	85.3
7			0.00	73.8	0.23	-	85.2
8			0.00	73.8	0.24	-	84.8
9			0.00	73.9	0.22	-	84.4
10	1.771	0.177	0.00	73.9	0.24	107	84.0
11			0.00	73.9	0.25	-	84.1
12			0.00	73.9	0.23	-	84.1
13			0.00	73.8	0.25	-	84.1
14			0.00	73.8	0.24	-	84.3
15			0.00	73.8	0.25	-	84.1
16			0.00	73.8	0.24	-	83.6
17			0.00	73.8	0.23	-	83.2
18			0.00	73.7	0.23	-	82.7
19			0.00	73.7	0.22	-	82.4
20	3.501	0.173	0.00	73.6	0.22	103	82.1
21			0.00	73.6	0.22	-	81.8
22			0.00	73.5	0.21	-	81.5
23			0.00	73.6	0.21	-	81.6
24			0.00	73.5	0.22	-	82.4
25			0.00	73.5	0.22	-	83.0
26			0.00	73.5	0.21	-	83.3
27			0.00	73.5	0.23	-	83.9
28			0.00	73.4	0.23	-	84.5
29			0.00	73.5	0.25	-	85.1
30	5.210	0.171	0.00	73.5	0.25	101	85.5
31			0.00	73.4	0.26	-	86.0



## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	73.4	0.27	-	86.5
33			0.00	73.4	0.25	-	86.9
34			0.00	73.4	0.26	-	87.0
35			0.00	73.3	0.26	-	86.7
36			0.00	73.3	0.27	-	86.5
37			0.00	73.3	0.25	-	86.1
38			0.00	73.3	0.26	-	85.8
39			0.00	73.3	0.26	-	85.6
40	6.938	0.173	0.00	73.4	0.27	102	85.2
41			0.00	73.4	0.27	-	84.8
42			0.00	73.4	0.27	-	84.6
43			0.00	73.5	0.25	-	84.4
44			0.00	73.5	0.25	-	84.1
45			0.00	73.6	0.25	-	83.8
46			0.00	73.5	0.25	-	83.6
47			0.00	73.5	0.26	-	83.6
48			0.00	73.5	0.26	-	83.4
49			0.00	73.5	0.25	-	83.3
50	8.661	0.172	0.00	73.5	0.25	101	83.2
51			0.00	73.6	0.25	-	82.9
52			0.00	73.6	0.25	-	82.8
53			0.00	73.5	0.25	-	82.8
54			0.00	73.5	0.26	-	82.7
55			0.00	73.5	0.26	-	82.5
56			0.00	73.5	0.26	-	82.4
57			0.00	73.5	0.26	-	82.3
58			0.00	73.6	0.25	-	82.2
59			0.00	73.6	0.26	-	82.2
60	10.388	0.173	0.00	73.6	0.26	101	82.2
Avg/Tot	10.388	0.173	0.00	73.6	0.24	103	84.2

Data from 12/2022 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	593.9	408.7	477.0	399.7	419.6	459.8	0
1	558.6	410.2	477.2	399.5	418.6	452.8	0
2	543.8	411.8	474.6	399.1	417.7	449.4	0
3	554.8	412.9	469.5	397.6	416.4	450.2	0
4	576.8	412.1	462.2	395.7	413.9	452.1	0
5	597.7	410.9	453.8	393.7	411.2	453.4	0
6	617.4	409.5	445.1	391.6	408.9	454.5	0
7	636.2	407.7	437.3	389.0	406.1	455.2	0
8	655.4	405.8	429.6	386.7	404.1	456.3	0
9	671.5	404.3	423.0	385.0	402.4	457.2	0
10	679.9	402.3	417.5	382.9	400.7	456.7	0
11	683.3	400.3	412.6	380.1	398.6	455.0	0
12	683.4	397.9	408.4	377.4	396.1	452.7	0
13	681.2	395.4	404.7	374.2	393.5	449.8	0
14	677.7	393.0	401.4	371.2	390.5	446.7	0
15	680.8	390.6	397.6	369.3	388.0	445.3	0
16	687.2	385.4	394.3	367.0	385.7	443.9	0
17	693.6	380.5	391.4	364.9	384.2	442.9	0
18	694.3	376.2	389.1	363.2	383.1	441.2	0
19	688.8	372.3	386.8	361.4	381.4	438.2	0
20	677.1	369.5	384.2	359.8	379.3	434.0	0
21	662.0	366.9	381.3	358.3	376.9	429.1	0
22	645.6	364.1	378.0	356.8	374.3	423.8	0
23	629.7	361.4	374.5	354.9	371.9	418.5	0
24	614.6	358.7	370.6	353.2	369.4	413.3	0
25	601.0	356.0	366.7	351.3	367.6	408.5	0
26	586.3	353.2	363.0	349.9	365.6	403.6	0
27	572.8	350.5	359.3	347.9	363.7	398.8	0
28	562.4	348.4	355.5	346.0	360.8	394.6	0
29	557.8	346.0	351.7	343.7	357.8	391.4	0
30	559.6	343.5	347.9	341.7	354.8	389.5	0
31	564.3	341.1	344.3	339.7	351.7	388.2	0
32	572.7	338.5	341.0	337.9	348.7	387.8	0
33	583.5	336.0	338.0	336.0	345.8	387.8	0
34	594.9	333.5	335.4	334.3	342.9	388.2	0
35	607.0	331.2	333.1	333.0	340.0	388.9	0
36	618.3	328.8	331.2	331.5	336.8	389.3	0
37	629.8	326.3	329.7	330.3	333.6	389.9	0
38	640.2	323.8	328.4	329.3	330.7	390.5	0
39	649.4	321.5	327.4	328.6	327.7	390.9	0
40	658.4	319.2	326.8	328.1	325.3	391.5	0
41	665.6	317.0	326.2	327.5	323.1	391.9	0
42	671.8	314.9	325.6	327.1	321.1	392.1	0
43	677.3	312.6	325.3	326.9	319.3	392.3	0
44	682.5	310.4	325.1	326.7	317.6	392.4	0
45	687.4	308.4	325.0	326.7	316.2	392.7	0
46	692.8	306.4	325.0	327.1	314.8	393.2	0
47	697.3	304.3	325.0	327.3	313.4	393.5	0

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	701.4	302.3	325.1	327.4	312.2	393.7	0
49	705.7	300.5	325.2	327.8	311.2	394.1	0
50	709.5	298.7	325.4	328.1	310.2	394.4	0
51	712.3	296.9	325.6	328.4	309.2	394.5	0
52	714.6	295.1	325.7	328.6	308.5	394.5	0
53	715.0	293.3	326.0	329.1	307.7	394.2	0
54	715.5	291.8	326.3	329.2	307.0	394.0	0
55	716.3	290.3	326.7	329.6	306.3	393.9	0
56	715.5	288.7	327.0	330.1	305.6	393.4	0
57	713.5	287.2	327.5	330.5	305.1	392.8	0
58	710.8	285.8	328.0	330.7	304.3	392.0	0
59	708.7	284.5	328.5	331.4	304.3	391.5	0
60	705.9	283.2	329.0	331.7	304.0	390.8	0
61	703.3	282.2	329.6	331.7	302.7	389.9	0
62	701.7	281.2	330.5	332.0	301.9	389.5	0
63	701.1	280.1	331.4	332.4	301.2	389.3	0
64	700.5	278.9	332.2	332.6	301.1	389.1	0
65	701.9	277.8	333.2	332.9	301.2	389.4	0
66	701.0	276.9	334.2	333.2	301.1	389.3	0
67	702.0	275.8	335.5	333.6	301.3	389.6	0
68	703.9	274.7	335.8	333.8	301.3	390.1	0
69	705.6	273.5	337.2	334.2	301.7	390.7	0
70	706.3	272.4	339.6	334.5	301.8	390.9	0
71	707.3	271.2	340.9	334.8	302.3	391.3	0
72	709.8	270.0	342.2	335.1	302.6	391.9	0
73	712.5	268.8	343.4	335.5	303.1	392.6	0
74	714.2	267.6	344.6	335.7	303.4	393.1	0
75	717.2	266.3	345.8	336.0	304.0	393.9	0
76	721.5	265.2	346.9	336.4	304.8	395.0	0
77	728.2	264.1	347.9	336.6	305.9	396.5	0
78	735.3	263.0	349.0	336.9	306.7	398.2	0
79	742.6	261.9	350.0	337.4	307.4	399.9	0
80	749.7	260.8	350.9	337.7	308.3	401.5	0
81	756.0	260.0	351.9	338.1	308.9	403.0	0
82	762.1	259.0	352.8	338.5	309.7	404.4	0
83	767.1	258.2	353.8	338.8	310.4	405.7	0
84	772.3	257.3	354.8	339.1	311.1	406.9	0
85	777.9	256.5	355.8	339.7	312.0	408.4	0
86	783.7	255.5	356.8	339.8	313.0	409.7	0
87	788.8	254.8	357.8	340.3	313.6	411.0	0
88	793.6	254.1	358.7	340.7	314.6	412.3	0
89	797.9	253.5	359.8	341.0	315.3	413.5	0
90	801.3	253.0	360.9	341.4	315.8	414.5	0
91	803.8	252.5	362.2	341.8	316.5	415.4	0
92	803.5	252.0	363.7	342.3	317.1	415.7	0
93	799.5	251.7	365.2	342.7	317.7	415.4	0
94	796.4	251.2	366.9	343.3	318.5	415.3	0
95	793.2	250.7	368.5	343.8	319.4	415.1	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
96	787.9	249.9	369.8	344.5	320.9	414.6	0
97	780.9	249.3	371.0	345.1	321.7	413.6	0
98	772.9	248.7	372.1	346.2	323.4	412.7	0
99	766.5	248.3	373.2	346.9	325.0	412.0	0
100	759.9	247.9	374.3	347.8	326.5	411.3	0
101	755.0	247.8	375.3	348.5	327.7	410.9	0
102	751.6	247.6	376.1	349.0	328.9	410.6	0
103	748.4	247.4	376.8	349.6	329.9	410.4	0
104	742.9	247.3	377.4	350.2	330.7	409.7	0
105	734.7	247.2	377.8	350.7	331.4	408.4	0
106	726.1	247.2	378.1	351.0	332.2	406.9	0
107	718.4	247.3	378.3	351.3	332.9	405.7	0
108	710.8	247.4	378.3	351.6	333.5	404.3	0
109	701.9	247.7	378.2	351.7	334.0	402.7	0
110	692.3	248.1	378.1	351.9	334.4	401.0	0
111	681.9	248.5	378.0	352.1	334.8	399.1	0
112	671.2	248.9	377.7	352.4	335.0	397.0	0
113	660.9	249.4	377.5	352.3	335.1	395.1	0
114	651.6	250.0	377.5	352.4	335.2	393.3	0
115	642.8	250.6	377.3	352.6	335.3	391.7	0
116	634.5	251.1	377.2	352.8	335.5	390.2	0
117	626.7	251.9	377.2	352.8	335.6	388.8	0
118	619.5	252.7	377.1	352.9	335.8	387.6	0
119	612.9	253.3	377.2	352.9	336.2	386.5	0
120	606.9	253.9	377.2	352.9	336.4	385.5	0
121	601.9	254.8	377.3	353.0	336.8	384.7	0
122	596.9	255.6	377.5	352.8	337.2	384.0	0
123	592.8	256.4	377.7	352.8	337.7	383.5	0
124	588.7	257.1	377.9	352.5	338.1	382.9	0
125	584.8	258.0	378.2	352.3	338.6	382.4	0
126	581.0	258.9	378.5	352.2	339.0	381.9	0
127	577.9	259.7	378.8	352.1	339.6	381.6	0
128	574.9	260.6	379.2	351.9	340.1	381.3	0
129	572.6	261.5	379.6	351.7	340.8	381.2	0
130	570.6	262.4	380.1	351.4	341.4	381.2	0
131	568.3	263.3	380.5	351.2	341.9	381.1	0
132	564.9	264.3	381.0	350.9	342.5	380.7	0
133	560.5	265.3	381.4	350.5	343.1	380.2	0
134	555.5	266.3	381.7	350.3	343.7	379.5	0
135	550.5	267.2	382.0	350.0	344.3	378.8	0
136	545.1	268.2	382.3	349.6	344.9	378.0	0
137	539.6	269.1	382.6	349.2	345.5	377.2	0
138	534.5	270.0	382.9	348.8	345.9	376.4	0
139	529.7	271.1	383.3	348.5	346.4	375.8	0
140	525.2	272.0	383.7	348.1	346.9	375.2	0
141	521.2	273.0	384.1	347.8	347.4	374.7	0
142	516.7	274.0	384.5	347.2	347.8	374.0	0
143	512.9	275.1	385.0	346.7	348.2	373.6	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
144	508.8	276.1	385.5	346.1	348.5	373.0	0
145	504.8	277.0	385.9	345.7	348.9	372.4	0
146	501.2	278.0	386.4	345.1	349.3	372.0	0
147	497.6	279.0	386.9	344.8	349.6	371.6	0
148	493.8	280.1	387.5	344.3	349.8	371.1	0
149	490.2	281.2	388.0	343.9	350.1	370.7	0
150	486.6	282.1	388.5	343.6	350.4	370.2	0
151	483.1	283.1	389.2	343.2	350.6	369.8	0
152	479.7	284.1	389.7	342.6	350.8	369.4	0
153	476.6	285.1	390.2	342.1	350.9	369.0	0
154	473.2	286.0	390.7	341.7	351.0	368.5	0
155	470.4	287.1	391.3	341.5	351.1	368.3	0
156	467.3	288.2	391.9	340.9	351.3	367.9	0
157	464.5	289.2	392.4	340.6	351.4	367.6	0
158	461.9	290.1	392.9	340.2	351.5	367.3	0
159	459.3	291.0	393.5	339.9	351.5	367.0	0
160	457.2	292.0	394.0	339.5	351.5	366.8	0
161	455.2	293.0	394.4	338.8	351.3	366.5	0
162	453.6	293.9	394.9	338.3	351.1	366.4	0
163	452.1	294.9	395.4	337.7	351.1	366.2	0
164	451.8	295.9	395.7	337.4	351.1	366.4	0
165	451.7	296.8	395.8	337.0	350.8	366.4	0
166	451.4	297.7	395.8	336.8	350.8	366.5	0
167	451.0	298.5	395.7	336.5	350.7	366.5	0
168	450.2	299.4	395.6	336.0	350.6	366.3	0
169	449.0	300.1	395.2	335.1	350.4	366.0	0
170	447.6	301.0	394.8	334.6	350.2	365.7	0
171	446.2	301.7	394.4	334.0	350.1	365.3	0
172	444.4	302.4	393.9	333.6	349.9	364.8	0
173	443.2	303.1	393.3	333.2	349.7	364.5	0
174	441.3	303.9	392.8	332.7	349.3	364.0	0
175	439.5	304.4	392.1	331.9	349.0	363.4	0
176	438.0	305.1	391.5	331.1	348.6	362.8	0
177	436.5	305.7	390.9	330.6	348.2	362.4	0
178	434.8	306.3	390.3	330.4	347.9	361.9	0
179	433.3	306.8	389.8	329.6	347.6	361.4	0
180	432.0	307.3	389.2	329.2	347.2	361.0	0
181	431.1	307.7	388.6	328.6	346.9	360.6	0
182	430.3	308.1	388.0	327.8	346.3	360.1	0
183	429.1	308.6	387.4	327.0	346.0	359.6	0
184	427.7	309.0	387.0	326.6	345.6	359.2	0
185	426.8	309.4	386.5	326.2	345.1	358.8	0
186	425.4	309.8	385.9	325.6	344.6	358.3	0
187	424.1	310.0	385.2	324.8	344.1	357.6	0
188	422.8	310.3	384.6	324.1	343.5	357.1	0
189	421.4	310.6	384.0	323.3	342.8	356.4	0
190	420.2	310.8	383.5	322.5	342.2	355.9	0
191	419.3	311.0	382.9	321.8	341.6	355.3	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
192	418.3	311.2	382.5	321.4	341.1	354.9	0
193	417.2	311.4	382.0	321.2	340.6	354.5	0
194	416.5	311.5	381.6	320.7	340.0	354.0	0
195	415.6	311.5	381.1	319.8	339.3	353.5	0
196	414.6	311.6	380.5	319.0	338.6	352.9	0
197	413.7	311.6	380.0	318.6	337.9	352.4	0
198	412.7	311.7	379.6	318.1	337.2	351.9	0
199	411.5	311.7	379.2	317.6	336.7	351.3	0
200	410.3	311.6	378.8	316.9	336.1	350.8	0
201	409.1	311.6	378.3	316.3	335.4	350.1	0
202	407.7	311.6	377.8	315.4	334.6	349.4	0
203	406.3	311.6	377.5	315.2	334.0	348.9	0
204	404.8	311.6	376.9	315.1	333.5	348.4	0
205	403.6	311.7	376.5	314.7	332.9	347.9	0
206	402.5	311.7	375.8	314.1	332.3	347.3	0
207	401.6	311.5	375.1	313.7	331.6	346.7	0
208	400.6	311.4	374.4	313.3	331.0	346.1	0
209	399.7	311.4	373.7	312.5	330.3	345.5	0
210	398.8	311.4	372.8	312.2	329.7	345.0	0
211	398.1	311.4	372.0	311.9	328.8	344.4	0
212	397.2	311.3	371.3	311.3	328.1	343.8	0
213	396.2	311.2	370.4	311.1	327.3	343.3	0
214	395.3	311.3	369.7	310.7	326.5	342.7	0
215	394.2	311.2	369.0	310.4	325.7	342.1	0
216	393.2	311.1	368.2	310.4	324.8	341.5	0
217	392.5	310.9	367.5	310.1	324.0	341.0	0
218	391.5	310.6	366.8	309.7	323.3	340.4	0
219	390.6	310.5	366.1	309.2	322.5	339.8	0
220	389.8	310.3	365.4	308.6	321.9	339.2	0
221	388.9	310.1	364.7	308.4	321.1	338.6	0
222	388.0	310.1	364.0	308.0	320.3	338.1	0
223	387.2	309.9	363.2	307.6	319.7	337.5	0
224	386.4	309.8	362.5	307.5	319.0	337.0	0
225	385.4	309.7	361.9	307.0	318.2	336.4	0
226	384.4	309.5	361.2	306.7	317.6	335.9	0
227	383.0	309.3	360.5	306.2	316.9	335.2	0
228	381.5	309.1	359.8	305.6	316.2	334.4	0
229	380.3	309.0	359.2	305.1	315.4	333.8	0
230	378.9	308.9	358.5	304.6	314.7	333.1	0
231	377.5	308.7	357.8	304.2	314.0	332.4	0
232	376.2	308.5	357.2	303.8	313.4	331.8	0
233	374.7	308.3	356.5	303.5	312.6	331.1	0
234	373.3	308.1	355.8	302.6	311.6	330.3	0
235	372.0	307.8	355.1	302.2	310.9	329.6	0
236	370.5	307.6	354.3	301.9	310.2	328.9	0
237	369.2	307.2	353.5	301.5	309.5	328.2	0
238	367.8	307.0	352.8	300.8	308.7	327.4	0
239	366.6	306.8	351.9	300.2	307.9	326.7	0

Data from 12/20/22 test - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
240	365.4	306.6	351.2	299.3	307.1	325.9	0
241	364.1	306.4	350.3	298.6	306.4	325.1	0
242	362.9	306.1	349.6	298.1	305.6	324.4	0
243	361.7	305.9	348.7	297.5	304.8	323.7	0
244	360.4	305.6	347.8	296.7	304.0	322.9	0
245	359.2	305.3	347.0	296.0	303.1	322.1	0
246	357.8	305.0	346.1	295.0	302.2	321.2	0
247	356.5	304.7	345.2	294.6	301.4	320.5	0
248	355.2	304.4	344.2	293.7	300.5	319.6	0
249	354.0	304.2	343.4	292.8	299.7	318.8	0
250	352.8	304.0	342.5	292.0	298.9	318.0	0
251	351.6	303.8	341.6	291.1	298.1	317.2	0
252	350.7	303.4	340.8	290.6	297.4	316.6	0
253	349.7	303.2	339.9	289.9	296.8	315.9	0
254	348.7	302.8	339.1	289.0	296.0	315.1	0
255	347.8	302.7	338.3	288.4	295.3	314.5	0
256	346.7	302.3	337.5	287.9	294.6	313.8	0
257	345.7	302.0	336.7	287.2	293.9	313.1	0
258	344.9	301.7	335.9	286.5	293.2	312.4	0
259	343.7	301.5	335.1	285.6	292.6	311.7	0
260	342.5	301.1	334.3	285.1	292.1	311.0	0
261	341.6	300.7	333.6	284.5	291.4	310.4	0
262	340.6	300.5	332.9	283.9	290.9	309.8	0
263	339.6	300.2	332.2	283.0	290.2	309.0	0
264	338.8	299.9	331.4	282.4	289.6	308.4	0
265	337.9	299.5	330.7	281.7	289.1	307.8	0
266	337.0	299.3	330.1	281.0	288.6	307.2	0
267	336.1	298.9	329.4	280.3	288.1	306.6	0
268	335.1	298.6	328.8	279.7	287.4	305.9	0
269	334.3	298.4	328.2	279.2	286.8	305.4	0
270	333.3	298.1	327.6	278.6	286.4	304.8	0
271	332.5	297.9	327.0	278.0	285.8	304.2	0
272	331.5	297.5	326.5	277.4	285.3	303.6	0
273	330.7	297.3	325.9	276.9	284.9	303.1	0
274	329.9	296.9	325.4	276.5	284.5	302.6	0
275	329.1	296.6	324.8	275.9	284.1	302.1	0
276	328.3	296.2	324.3	275.2	283.8	301.6	0
277	327.5	295.9	323.8	274.3	283.3	301.0	0
278	326.8	295.6	323.2	273.8	282.9	300.4	0
279	325.9	295.3	322.7	273.1	282.5	299.9	0
280	325.1	295.0	322.2	272.5	282.0	299.4	0
281	324.3	294.6	321.7	272.0	281.5	298.8	0
282	323.7	294.4	321.2	271.2	281.2	298.4	0
283	323.0	294.0	320.8	270.9	280.8	297.9	0
284	322.0	293.7	320.3	270.1	280.3	297.3	0
285	321.3	293.4	319.9	269.5	279.8	296.8	0
286	320.3	293.1	319.4	268.7	279.3	296.2	0
287	319.5	292.9	318.9	267.9	279.0	295.7	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
288	316.5	293.8	319.0	267.7	278.7	295.1	0
289	315.3	293.5	319.3	266.9	278.4	294.7	0
290	314.6	293.2	318.9	266.6	278.1	294.3	0
291	313.8	292.7	317.9	265.9	277.6	293.6	0
292	313.0	292.3	316.5	265.5	277.2	292.9	0
293	311.9	291.7	314.8	265.1	276.7	292.1	0
294	310.8	291.2	313.0	264.5	276.3	291.2	0
295	309.6	290.6	311.0	264.2	275.8	290.3	0
296	308.1	289.8	309.0	263.8	275.3	289.2	0
297	306.9	289.1	306.9	263.5	274.7	288.2	0
298	305.5	288.3	304.9	262.9	274.0	287.1	0
299	304.0	287.4	302.8	262.5	273.4	286.0	0
300	302.5	286.5	300.8	261.8	272.6	284.9	0
301	301.0	285.5	298.9	261.1	271.7	283.6	0
302	299.4	284.6	296.9	260.5	270.8	282.4	0
303	297.9	283.5	295.1	259.7	269.7	281.2	0
304	296.3	282.4	293.2	258.8	268.7	279.9	0
305	294.6	281.3	291.4	257.7	267.7	278.5	0
306	293.0	280.0	289.6	256.9	266.5	277.2	0
307	291.7	278.7	287.8	255.9	265.4	275.9	0
308	290.1	277.4	286.1	254.9	264.2	274.5	0
309	288.5	276.1	284.4	253.7	263.0	273.2	0
310	287.0	274.8	282.7	252.8	261.8	271.8	0
311	285.5	273.5	281.1	251.9	260.6	270.5	0
312	284.1	272.2	279.5	250.7	259.4	269.2	0
313	282.8	270.9	278.0	249.7	258.2	267.9	0
314	281.2	269.6	276.4	248.7	257.0	266.6	0
315	279.9	268.3	274.8	247.6	255.8	265.3	0
316	278.4	267.0	273.4	246.6	254.6	264.0	0
317	277.2	265.8	272.0	245.6	253.5	262.8	0
318	275.9	264.6	270.5	244.5	252.3	261.6	0
319	274.4	263.4	269.1	243.6	251.1	260.3	0
320	273.1	262.1	267.8	242.4	249.8	259.1	0
321	271.9	260.9	266.4	241.3	248.7	257.9	0
322	270.5	259.6	265.1	240.2	247.6	256.6	0
323	269.2	258.5	263.8	239.0	246.4	255.4	0
324	267.9	257.4	262.6	238.0	245.3	254.2	0
325	266.7	256.2	261.3	237.1	244.1	253.1	0
326	265.5	255.0	260.0	236.1	243.0	251.9	0
327	264.3	253.9	258.8	235.1	241.9	250.8	0
328	263.0	252.8	257.6	234.1	240.8	249.7	0
329	261.8	251.6	256.4	233.2	239.7	248.5	0
330	260.4	250.7	255.3	232.0	238.5	247.4	0
331	259.2	249.6	254.0	231.1	237.5	246.3	0
332	258.0	248.5	252.9	230.1	236.4	245.2	0
333	256.9	247.5	251.7	229.3	235.4	244.2	0
334	255.7	246.5	250.6	228.3	234.4	243.1	0
335	254.4	245.5	249.4	227.5	233.4	242.0	0

Data from 12/20/22 test - Reference only



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
336	253.2	244.6	248.3	226.6	232.3	241.0	0
337	252.1	243.7	247.2	225.6	231.3	240.0	0
338	250.9	242.6	246.0	224.6	230.3	238.9	0
339	249.7	241.7	245.0	223.6	229.4	237.9	0
340	248.5	240.8	243.8	222.8	228.5	236.9	0
341	247.3	239.9	242.8	221.9	227.5	235.9	0
342	247.2	239.9	242.7	221.8	227.5	235.8	0
Average	491.5	294.6	351.3	315.4	317.7	354	0

Data from 12/2022 testing - Reference only

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 2

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/19/2022

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0119	187.1	190.0	2.9
	<b>B</b>	H0120	187.6	190.9	3.3
	<b>C - 1st Hour</b>	H0121	188.4	191.5	3.1
	<b>Amb</b>	H0147	91.1	91.3	0.2
<b>Probes</b>	<b>A</b>	12A	116704.8	116704.9	0.1
	<b>B</b>	12B	117771.0	117771.1	0.1
	<b>C - 1st Hour</b>	12C	117171.1	117171.1	0.0
<b>O-rings</b>	<b>A</b>	12A	3586.6	3586.8	0.2
	<b>B</b>	12B	3551.4	3551.4	0.0
	<b>C - 1st Hour</b>	12C	3617.5	3617.6	0.1

**Placed in Dessicator on:**

<b>Filters</b>	<b>A</b>	189.9	12/19 8:12	190.0	12/31 11:58	190.0	1/3 9:40		
	<b>B</b>	191.3	12/19 8:12	190.9	12/31 11:59	190.9	1/3 9:41		
	<b>C - 1st Hour</b>	191.6	12/19 8:12	191.5	12/31 11:59	191.5	1/3 9:41		
	<b>Amb</b>	91.1	12/19 8:12	91.4	12/31 12:12	91.3	1/3 9:41		
<b>Probes</b>	<b>A</b>			116705.0	12/31 12:11	116704.9	1/3 9:41		
	<b>B</b>			117771.2	12/31 12:11	117771.1	1/3 9:41		
	<b>C - 1st Hour</b>			117171.1	12/31 12:11	117171.1	1/3 9:41		
<b>O-Rings</b>	<b>A</b>			3586.9	12/31 11:58	3586.8	1/3 9:41		
	<b>B</b>			3551.4	12/31 11:58	3551.4	1/3 9:41		
	<b>C - 1st Hour</b>			3617.6	12/31 11:58	3617.6	1/3 9:41		

<b>Train A Aggregate, mg:</b>	<b>3.2</b>
<b>Train B Aggregate, mg:</b>	<b>3.4</b>
<b>Train C Aggregate, mg:</b>	<b>3.2</b>
<b>Ambient Aggregate, mg:</b>	<b>0.2</b>

**WOOD STOVE TEST DATA PACKET**  
**ASTM E3053/E2515**



**Run 3 Data Summary**

Client: SBI  
Model: J.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/20/2022

*Data from 12/20/2022 testing - reference only*

  
\_\_\_\_\_  
Technician Signature

7/12/2023  
\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

<b>Burn Rate (kg/hr):</b>	<b>4.33</b>
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	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	20.846	15.825	15.852	10.143
Average Gas Velocity in Dilution Tunnel (ft/sec)	23.44			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	26579.4			
Average Gas Meter Temperature (°F)	79.6	72.1	71.3	72.0
Total Sample Volume (dscf)	20.506	15.987	15.976	10.009
Average Tunnel Temperature (°F)	110.5			
Total Time of Test (min)	94			
Total Particulate Catch (mg)	0.1	2.6	2.7	2.4
Particulate Concentration, dry-standard (g/dscf)	0.0000049	0.0001626	0.0001690	0.0002398
Total PM Emissions (g)	0.20	6.57	6.83	6.24
Particulate Emission Rate (g/hr)	0.13	4.19	4.36	6.24
Emissions Factor (g/kg)	-	0.98	1.02	-
Difference from Average Total Particulate Emissions (g)	-	0.13	0.13	-
Difference from Average Total Particulate Emissions (%)	-	2.0%	2.0%	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	6.70
Particulate Emission Rate (g/hr)	4.28
Emissions Factor (g/kg)	1.00
HHV Efficiency (%)	69.5%
LHV Efficiency (%)	74.5%
CO Emissions (g/min)	3.40

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 81.9/Max: 87.8	OK
Face Velocity	< 30 ft/min	9.2	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:70.4/Max:86.2	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/20/22  
**Run:** 3  
**Control #:** 22-835  
**Test Duration:** 67  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	69.5%	74.5%
<b>Combustion Efficiency</b>	96.6%	96.6%
<b>Heat Transfer Efficiency</b>	72.0%	77.1%

<b>Output Rate (kJ/h)</b>	57,869	54,895	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	4.43	9.76	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	83,212	78,935	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	4.94	10.89	<b>dry lb</b>
<b>MC wet (%)</b>	16.62		
<b>MC dry (%)</b>	19.93		
<b>Particulate (g)</b>	6.70		
<b>CO (g)</b>	228		
<b>Test Duration (h)</b>	1.12		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.10	3.52
<b>g/kg Dry Fuel</b>	1.36	46.09
<b>g/h</b>	6.00	203.98
<b>g/min</b>	0.10	3.40
<b>lb/MM Btu Output</b>	0.24	8.19

<b>Air/Fuel Ratio (A/F)</b>	8.07
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VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/20/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.89  
 Max Allowable Start-up Fuel Weight (lbs): 4.33

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	16.00	3.06	In Range	26.8	17.9	18.9	21.2	In Range	2.53	1.15	
2	15.83	2.87	In Range	22.0	18.4	18.1	19.5	In Range	2.40	1.09	
3	15.75	2.45	In Range	26.6	16.8	18.3	20.6	In Range	2.03	0.92	
Core Load Wt. (lbs)		8.38	In Range								

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	16.00	2.38	In Range	27.0	14.3	14.2	18.5	In Range	2.01	0.91	
2	16.00	3.67	In Range	28.1	16.2	14.9	19.7	In Range	3.06	1.39	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.05	In Range								

Total Load Weight (lbs): 14.43 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: 100% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.0  
 Total Load Average Moisture Content (%DB): 19.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.6  
 Total Test Load Weight (dry basis): 12.03 lbs 5.46 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Avg.	Within Spec?	Dry Weight	
		1	2	3				lbs	kg
2.84	In Range	10	10	10	10.0	In Range	2.58	1.17	

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Avg.	Within Spec?	Dry Weight	
		1	2	3				lbs	kg
4.19	In Range	24.6	18.8	19.9	21.1	In Range	3.46	1.57	

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.4 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 1.97 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.3 to 1.59 lb  
 Actual Fuel Load Ending Weight (lb): 1.37 In Range

Total Weight All Fuel Added: 21.46 lbs, wet basis      Total Weight All Fuel Burned (dry basis): 14.74 lbs  
 18.08 lbs, dry basis      6.68 kg  
 8.20 kg, dry basis

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3  
 Test Start Time: 10:42  
 Test Type: High Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 94  
 High Fire Test Load Time (min): 27

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.80	29.78	29.79
Relative Humidity (%)	26.7	26.4	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	20.846 ft <sup>3</sup>		

### Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.117	70
2	0.143	70
3	0.137	70
4	0.124	70
5	0.085	70
6	0.127	70
7	0.137	70
8	0.125	70
Center	0.145	70

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

$V_{strav}$ : 23.41 ft/sec  
 $V_{scent}$ : 25.34 ft/sec  
 $F_p$ : 0.924 [ratio]

Initial Tunnel Flow: 476.4 scf/min

Static Pressure: -0.290 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 3

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/20/2022

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

Data from 12/2022 testing - Reference only



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.144	0.00	71.7	0.21		7.11		75.3	119.9	86.9	70.4
1			0.144	0.00	71.7	0.24	-	6.98	-0.12	76.3	181.5	86.7	70.4
2			0.144	0.00	71.8	0.25	-	6.83	-0.16	76.6	266.2	85.5	70.5
3			0.144	0.00	71.7	0.25	-	6.67	-0.16	78.6	337.4	84.4	70.5
4			0.143	0.00	71.8	0.28	-	6.48	-0.19	81.1	397.5	83.6	70.4
5			0.142	0.00	71.8	0.30	-	6.25	-0.23	83.9	454.4	82.8	70.4
6			0.142	0.00	71.8	0.33	-	6.01	-0.24	86.2	496.8	82.2	70.5
7			0.138	0.00	71.9	0.35	-	5.82	-0.19	87.2	508.2	82.2	70.7
8			0.139	0.00	71.9	0.36	-	5.61	-0.21	88.8	525.5	82.7	70.9
9			0.140	0.00	71.9	0.37	-	5.40	-0.21	90.2	539.1	83.2	70.8
10	1.698	0.170	0.140	0.00	72.0	0.36	96	5.20	-0.21	91.1	547.4	83.6	71.1
11			0.137	0.00	72.0	0.38	-	5.02	-0.18	91.5	542.4	84.1	71.3
12			0.138	0.00	72.0	0.38	-	4.81	-0.20	92.3	548.2	84.3	71.8
13			0.139	0.00	71.9	0.39	-	4.59	-0.23	94.2	568.2	84.6	72.2
14			0.139	0.00	72.0	0.38	-	4.39	-0.20	95.0	569.7	85.0	72.6
15			0.137	0.00	71.9	0.40	-	4.15	-0.24	96.9	588.4	85.3	72.9
16			0.138	0.00	71.9	0.38	-	3.90	-0.24	98.3	604.0	85.8	73.2
17			0.138	0.00	71.9	0.40	-	3.66	-0.25	99.5	612.9	86.1	73.5
18			0.138	0.00	71.9	0.42	-	3.43	-0.23	100.4	613.7	86.6	73.5
19			0.137	0.00	71.9	0.41	-	3.23	-0.21	100.3	609.7	87.0	74.4
20	3.393	0.169	0.135	0.00	71.9	0.41	99	3.02	-0.20	100.5	606.7	87.6	74.5
21			0.136	0.00	71.9	0.42	-	2.83	-0.19	100.8	602.3	86.7	74.9
22			0.134	0.00	72.0	0.41	-	2.64	-0.19	101.0	597.6	85.9	75.0
23			0.136	0.00	72.0	0.42	-	2.46	-0.18	101.0	593.5	85.4	75.5
24			0.138	0.00	72.0	0.42	-	2.31	-0.16	101.3	591.4	84.9	75.5
25			0.137	0.00	72.0	0.43	-	2.15	-0.16	99.6	593.5	84.5	75.9
26			0.137	0.00	72.0	0.41	-	1.97	-0.18	98.4	596.4	84.1	76.8
27			0.128	0.00	71.9	0.45	-	14.43	12.46	133.7	615.6	84.2	77.8
28			0.132	0.00	71.9	0.45	-	14.02	-0.41	118.7	584.1	84.0	79.4
29			0.135	0.00	71.9	0.45	-	13.78	-0.25	108.4	591.2	83.5	78.9
30	5.095	0.170	0.135	0.00	71.9	0.45	101	13.58	-0.20	107.2	595.0	82.9	78.0
31			0.134	0.00	72.0	0.45	-	13.39	-0.18	106.6	590.7	82.9	78.1
32			0.136	0.00	72.0	0.45	-	13.21	-0.19	106.1	588.4	82.7	78.1

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.136	0.00	72.1	0.45	-	13.03	-0.17	106.1	585.3	82.6	78.4
34			0.136	0.00	72.2	0.45	-	12.83	-0.21	106.5	589.3	82.5	78.7
35			0.136	0.00	72.2	0.44	-	12.65	-0.18	106.8	588.1	82.5	78.3
36			0.136	0.00	72.2	0.45	-	12.46	-0.19	106.9	586.5	82.3	78.8
37			0.136	0.00	72.2	0.43	-	12.27	-0.19	106.9	584.7	82.1	78.9
38			0.136	0.00	72.2	0.44	-	12.09	-0.19	107.2	586.1	81.9	79.0
39			0.135	0.00	72.2	0.43	-	11.90	-0.19	107.6	588.1	82.2	79.1
40	6.786	0.169	0.136	0.00	72.3	0.43	100	11.72	-0.19	107.9	588.8	82.4	79.3
41			0.134	0.00	72.3	0.44	-	11.51	-0.20	108.4	593.6	82.6	79.5
42			0.136	0.00	72.2	0.45	-	11.32	-0.20	108.9	599.8	82.9	79.8
43			0.135	0.00	72.2	0.44	-	11.10	-0.22	109.7	610.3	83.1	80.1
44			0.134	0.00	72.1	0.44	-	10.88	-0.22	111.0	624.8	83.4	79.7
45			0.133	0.00	72.1	0.46	-	10.65	-0.23	112.2	639.4	83.7	80.0
46			0.132	0.00	72.1	0.44	-	10.40	-0.25	113.6	656.2	84.2	80.5
47			0.132	0.00	72.0	0.44	-	10.14	-0.26	115.0	672.3	84.4	80.6
48			0.132	0.00	72.0	0.44	-	9.88	-0.26	116.4	689.6	84.6	80.7
49			0.134	0.00	72.0	0.45	-	9.61	-0.27	117.8	706.0	84.9	81.3
50	8.476	0.169	0.133	0.00	72.1	0.45	101	9.33	-0.28	119.1	724.8	85.2	81.6
51			0.134	0.00	72.1	0.46	-	9.07	-0.26	120.5	739.6	85.3	81.6
52			0.133	0.00	72.2	0.47	-	8.80	-0.27	121.8	750.7	85.7	82.1
53			0.133	0.00	72.1	0.48	-	8.50	-0.30	122.7	759.2	86.0	82.1
54			0.133	0.00	72.1	0.49	-	8.21	-0.29	123.9	763.7	86.1	82.4
55			0.133	0.00	72.1	0.50	-	7.92	-0.29	124.9	762.7	86.0	82.5
56			0.133	0.00	72.2	0.51	-	7.62	-0.29	124.8	761.5	85.9	83.0
57			0.130	0.00	72.1	0.51	-	7.33	-0.30	125.7	761.4	86.0	83.0
58			0.129	0.00	72.1	0.53	-	7.05	-0.28	126.2	762.8	86.0	83.1
59			0.128	0.00	72.2	0.52	-	6.75	-0.30	127.0	765.5	86.3	83.6
60	10.143	0.167	0.129	0.00	72.1	0.56	102	6.49	-0.27	127.1	766.1	86.4	83.8
61			0.131	0.00	72.1	0.57	-	6.22	-0.27	127.6	767.6	86.6	84.3
62			0.130	0.00	72.1	0.59	-	5.93	-0.29	127.9	769.9	86.6	84.7
63			0.131	0.00	72.1	0.59	-	5.68	-0.25	128.2	773.2	86.9	84.5
64			0.131	0.00	72.2	0.59	-	5.40	-0.28	128.8	773.8	86.8	85.1
65			0.131	0.00	72.3	0.61	-	5.14	-0.26	128.8	773.7	86.4	85.2

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.130	0.00	72.4	0.62	-	4.89	-0.26	128.8	772.6	86.3	85.6
67			0.130	0.00	72.4	0.63	-	4.64	-0.25	129.3	772.5	86.0	85.9
68			0.132	0.00	72.5	0.64	-	4.39	-0.25	129.3	772.7	85.8	86.0
69			0.130	0.00	72.5	0.63	-	4.17	-0.22	129.3	774.5	85.5	83.9
70	11.804	0.166	0.131	0.00	72.5	0.64	102	3.98	-0.19	127.0	777.3	85.3	81.0
71			0.132	0.00	72.4	0.66	-	3.81	-0.17	125.7	778.6	85.0	81.9
72			0.131	0.00	72.4	0.66	-	3.60	-0.22	125.1	780.3	84.8	81.6
73			0.131	0.00	72.3	0.66	-	3.39	-0.20	124.2	775.0	84.6	83.0
74			0.134	0.00	72.3	0.66	-	3.22	-0.17	123.3	763.8	84.5	81.6
75			0.133	0.00	72.3	0.66	-	3.07	-0.15	122.2	747.1	84.4	81.3
76			0.132	0.00	72.4	0.67	-	2.90	-0.17	120.8	728.0	84.2	82.7
77			0.133	0.00	72.3	0.66	-	2.75	-0.15	119.5	706.3	83.9	82.5
78			0.134	0.00	72.3	0.67	-	2.63	-0.12	117.7	684.1	83.7	81.4
79			0.133	0.00	72.3	0.67	-	2.50	-0.12	116.4	662.3	83.6	83.0
80	13.468	0.166	0.133	0.00	72.4	0.68	101	2.40	-0.11	117.2	642.9	83.5	84.6
81			0.134	0.00	72.4	0.67	-	2.29	-0.11	117.0	626.4	83.5	84.8
82			0.135	0.00	72.4	0.67	-	2.19	-0.10	116.9	612.6	83.4	85.0
83			0.135	0.00	72.4	0.68	-	2.10	-0.09	116.4	600.7	83.2	85.1
84			0.135	0.00	72.4	0.68	-	2.02	-0.08	115.7	591.8	83.1	85.7
85			0.134	0.00	72.4	0.67	-	1.93	-0.10	115.3	583.1	82.9	85.4
86			0.137	0.00	72.5	0.69	-	1.85	-0.07	115.0	576.0	82.7	85.7
87			0.136	0.00	72.5	0.67	-	1.78	-0.08	114.4	569.6	82.6	85.5
88			0.137	0.00	72.4	0.67	-	1.70	-0.07	114.0	563.2	82.4	86.0
89			0.136	0.00	72.4	0.67	-	1.64	-0.07	113.4	556.5	82.2	85.8
90	15.137	0.167	0.137	0.00	72.4	0.67	99	1.57	-0.06	112.9	550.5	82.0	85.6
91			0.136	0.00	72.4	0.67	-	1.51	-0.06	112.5	545.0	82.1	86.2
92			0.138	0.00	72.5	0.68	-	1.44	-0.07	111.8	539.4	82.5	84.4
93			0.136	0.00	72.5	0.68	-	1.38	-0.06	111.2	534.7	83.0	85.4
94	15.825	0.172	0.136	0.00	72.5	0.67	103	1.37	-0.01	111.2	534.2	83.1	85.8
Avg/Tot	15.825	0.169	0.135	0.00	72.1	0.50	100			110.5	622.8	84.3	79.6

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	70.8	0.47		87.8	-0.042	1.74	0.028	28.3	35.2
1			0.00	70.8	0.50	-	87.4	-0.054	2.17	0.033	30.5	41.2
2			0.00	70.8	0.52	-	85.6	-0.070	7.90	0.104	28.9	41.7
3			0.00	70.8	0.51	-	85.0	-0.077	9.54	0.245	33.7	45.0
4			0.00	70.9	0.53	-	84.5	-0.084	10.74	0.342	34.8	47.5
5			0.00	70.9	0.50	-	83.9	-0.090	11.79	0.777	35.1	49.8
6			0.00	70.9	0.60	-	83.7	-0.093	13.19	1.283	35.3	52.3
7			0.00	71.0	0.50	-	83.7	-0.091	12.84	0.307	34.4	54.0
8			0.00	71.0	0.62	-	83.6	-0.094	12.36	0.311	31.9	52.7
9			0.00	71.0	0.52	-	83.4	-0.095	12.86	0.214	31.2	53.4
10	1.707	0.171	0.00	71.1	0.55	96	83.4	-0.095	13.55	0.167	30.4	54.0
11			0.00	71.1	0.58	-	83.3	-0.095	11.94	0.107	29.5	54.0
12			0.00	71.1	0.58	-	83.3	-0.096	12.33	0.118	28.1	52.9
13			0.00	71.1	0.54	-	83.3	-0.097	14.66	0.222	27.8	53.2
14			0.00	71.1	0.57	-	83.2	-0.099	13.13	0.049	27.9	55.2
15			0.00	71.1	0.63	-	83.3	-0.098	15.15	0.176	27.0	54.9
16			0.00	71.1	0.55	-	83.5	-0.102	15.98	0.391	27.5	57.0
17			0.00	71.1	0.51	-	83.4	-0.102	16.29	0.490	27.0	57.6
18			0.00	71.1	0.64	-	83.5	-0.102	15.89	0.301	26.2	57.7
19			0.00	71.1	0.67	-	83.6	-0.100	15.25	0.221	25.0	57.4
20	3.398	0.169	0.00	71.1	0.59	98	83.8	-0.101	14.69	0.129	24.5	56.8
21			0.00	71.1	0.67	-	83.6	-0.099	14.25	0.150	24.0	56.3
22			0.00	71.2	0.64	-	83.6	-0.099	13.63	0.150	23.2	55.8
23			0.00	71.2	0.65	-	83.4	-0.099	13.40	0.092	22.5	55.0
24			0.00	71.2	0.64	-	83.3	-0.098	13.34	0.101	21.8	54.3
25			0.00	71.2	0.58	-	83.3	-0.100	13.21	0.128	21.5	54.1
26			0.00	71.2	0.58	-	83.4	-0.100	13.84	0.118	22.4	53.2
27			0.00	71.1	0.64	-	83.1	-0.108	7.73	0.085	22.4	53.1
28			0.00	71.1	0.63	-	82.9	-0.099	5.01	0.110	14.2	59.7
29			0.00	71.1	0.62	-	82.7	-0.101	13.65	0.108	15.2	57.2
30	5.096	0.170	0.00	71.1	0.62	100	82.9	-0.102	13.64	0.105	21.1	59.4
31			0.00	71.2	0.65	-	83.5	-0.100	12.54	0.075	21.3	59.2
32			0.00	71.2	0.68	-	84.3	-0.099	12.13	0.139	21.1	58.1
33			0.00	71.3	0.62	-	84.8	-0.100	11.74	0.068	21.1	57.7
34			0.00	71.3	0.70	-	85.5	-0.100	12.89	0.050	21.0	57.4
35			0.00	71.4	0.69	-	86.0	-0.100	12.61	0.062	21.1	57.9
36			0.00	71.4	0.67	-	86.6	-0.100	12.19	0.081	20.9	57.7
37			0.00	71.4	0.64	-	87.1	-0.100	11.94	0.073	20.5	57.4
38			0.00	71.4	0.62	-	86.8	-0.100	12.27	0.067	20.4	57.2

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	71.4	0.62	-	86.5	-0.101	12.46	0.075	20.3	57.4
40	6.797	0.170	0.00	71.4	0.63	100	86.2	-0.100	12.34	0.073	20.2	57.6
41			0.00	71.4	0.68	-	85.9	-0.101	12.83	0.098	20.2	57.7
42			0.00	71.4	0.69	-	85.6	-0.102	13.27	0.090	20.3	58.1
43			0.00	71.4	0.69	-	85.4	-0.104	13.92	0.147	20.2	58.6
44			0.00	71.3	0.62	-	85.2	-0.105	14.66	0.207	20.3	59.2
45			0.00	71.3	0.69	-	84.8	-0.106	15.28	0.342	20.2	60.1
46			0.00	71.3	0.67	-	84.5	-0.109	15.75	0.491	20.1	60.8
47			0.00	71.3	0.62	-	84.2	-0.109	16.03	0.759	19.8	61.7
48			0.00	71.3	0.62	-	83.9	-0.109	16.27	1.010	19.6	62.4
49			0.00	71.3	0.61	-	83.7	-0.109	16.48	1.125	19.3	63.0
50	8.491	0.169	0.00	71.3	0.65	101	83.5	-0.109	16.94	1.276	18.8	63.5
51			0.00	71.4	0.66	-	83.3	-0.109	17.16	1.317	18.5	64.2
52			0.00	71.4	0.65	-	83.1	-0.109	17.65	1.281	18.1	64.8
53			0.00	71.3	0.62	-	83.1	-0.109	18.16	1.334	17.8	65.1
54			0.00	71.3	0.66	-	83.0	-0.109	18.42	1.566	17.7	65.7
55			0.00	71.4	0.65	-	83.1	-0.109	18.50	1.691	17.3	65.5
56			0.00	71.3	0.61	-	83.0	-0.109	18.57	1.705	17.0	64.9
57			0.00	71.3	0.73	-	83.0	-0.109	18.62	1.674	16.9	64.8
58			0.00	71.4	0.69	-	82.8	-0.109	18.65	1.601	16.8	64.4
59			0.00	71.4	0.74	-	82.8	-0.109	18.75	1.501	16.5	64.0
60	10.165	0.167	0.00	71.4	0.73	102	82.6	-0.109	18.77	1.422	16.3	63.7
61			0.00	71.3	0.78	-	82.5	-0.109	18.75	1.401	16.0	63.1
62			0.00	71.3	0.80	-	82.5	-0.109	18.76	1.356	15.8	62.8
63			0.00	71.3	0.76	-	82.5	-0.109	18.83	1.311	15.6	62.4
64			0.00	71.4	0.80	-	82.8	-0.109	18.93	1.350	15.4	62.1
65			0.00	71.5	0.82	-	82.8	-0.109	18.94	1.326	15.2	61.7
66			0.00	71.5	0.79	-	83.1	-0.109	19.02	1.247	15.0	61.3
67			0.00	71.6	0.85	-	83.1	-0.109	18.92	1.344	14.8	61.0
68			0.00	71.6	0.80	-	83.3	-0.109	18.84	1.298	14.7	60.6
69			0.00	71.6	0.83	-	83.3	-0.109	18.73	1.206	14.4	60.1
70	11.830	0.166	0.00	71.6	0.89	102	83.3	-0.109	18.52	1.164	14.3	60.1
71			0.00	71.6	0.83	-	83.3	-0.109	18.42	1.212	14.7	60.8
72			0.00	71.5	0.86	-	83.3	-0.109	18.40	1.040	15.0	61.2
73			0.00	71.5	0.85	-	83.5	-0.109	18.14	0.901	15.0	61.2
74			0.00	71.5	0.89	-	83.5	-0.109	17.71	0.781	15.0	61.3
75			0.00	71.5	0.90	-	83.4	-0.109	17.10	0.740	14.9	61.2
76			0.00	71.5	0.85	-	83.4	-0.109	16.52	0.598	14.8	60.6
77			0.00	71.5	0.90	-	83.5	-0.107	15.83	0.409	14.8	59.7

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	71.4	0.83	-	83.5	-0.104	13.96	0.172	14.6	58.5
79			0.00	71.4	0.90	-	83.5	-0.103	12.75	0.061	14.4	56.5
80	13.499	0.167	0.00	71.5	0.83	101	83.5	-0.101	11.92	0.023	14.4	55.4
81			0.00	71.5	0.85	-	83.5	-0.099	11.19	0.000	13.7	54.5
82			0.00	71.5	0.89	-	83.4	-0.098	10.84	0.000	13.3	53.6
83			0.00	71.5	0.89	-	83.4	-0.097	10.67	0.000	13.1	52.9
84			0.00	71.6	0.90	-	83.2	-0.096	10.67	0.000	12.9	52.3
85			0.00	71.6	0.82	-	83.1	-0.096	10.56	0.000	12.9	51.8
86			0.00	71.7	0.88	-	83.1	-0.094	10.46	0.000	12.8	51.4
87			0.00	71.7	0.88	-	83.1	-0.094	10.33	0.000	12.8	50.9
88			0.00	71.6	0.84	-	83.1	-0.093	10.23	0.000	12.7	50.4
89			0.00	71.6	0.91	-	83.1	-0.092	10.10	0.000	12.7	50.0
90	15.169	0.167	0.00	71.7	0.88	99	83.1	-0.092	9.84	0.000	12.7	49.6
91			0.00	71.7	0.85	-	83.0	-0.092	9.55	0.000	12.7	49.3
92			0.00	71.7	0.84	-	82.9	-0.092	9.40	0.000	12.7	48.9
93			0.00	71.7	0.87	-	82.9	-0.091	9.34	0.000	12.8	48.6
94	15.852	0.171	0.00	71.7	0.89	101	82.9	-0.091	9.33	0.000	12.8	48.2
Avg/Tot	15.852	0.169	0.00	71.3	0.87	100	83.8	-0.100	13.95	0.500	19.84	56.701

Data from 12/20/22 testing - Reference only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	71.7	0.21		86.9
1			0.00	71.7	0.24	-	86.7
2			0.00	71.8	0.25	-	85.5
3			0.00	71.7	0.25	-	84.4
4			0.00	71.8	0.28	-	83.6
5			0.00	71.8	0.30	-	82.8
6			0.00	71.8	0.33	-	82.2
7			0.00	71.9	0.35	-	82.2
8			0.00	71.9	0.36	-	82.7
9			0.00	71.9	0.37	-	83.2
10	1.698	0.170	0.00	72.0	0.36	96	83.6
11			0.00	72.0	0.38	-	84.1
12			0.00	72.0	0.38	-	84.3
13			0.00	71.9	0.39	-	84.6
14			0.00	72.0	0.38	-	85.0
15			0.00	71.9	0.40	-	85.3
16			0.00	71.9	0.38	-	85.8
17			0.00	71.9	0.40	-	86.1
18			0.00	71.9	0.42	-	86.6
19			0.00	71.9	0.41	-	87.0
20	3.393	0.169	0.00	71.9	0.41	98	87.6
21			0.00	71.9	0.42	-	86.7
22			0.00	72.0	0.41	-	85.9
23			0.00	72.0	0.42	-	85.4
24			0.00	72.0	0.42	-	84.9
25			0.00	72.0	0.43	-	84.5
26			0.00	72.0	0.41	-	84.1
27			0.00	71.9	0.45	-	84.2
28			0.00	71.9	0.45	-	84.0
29			0.00	71.9	0.45	-	83.5
30	5.095	0.170	0.00	71.9	0.45	100	82.9
31			0.00	72.0	0.45	-	82.9

Data from 12/20/2022 testing - Reference only

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI

Job #: 22-835

Model: 1.7R

Tracking #: 135

Run #: 3

Technician: AK

Date: 12/20/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	72.0	0.45	-	82.7
33			0.00	72.1	0.45	-	82.6
34			0.00	72.2	0.45	-	82.5
35			0.00	72.2	0.44	-	82.5
36			0.00	72.2	0.45	-	82.3
37			0.00	72.2	0.43	-	82.1
38			0.00	72.2	0.44	-	81.9
39			0.00	72.2	0.43	-	82.2
40	6.786	0.169	0.00	72.3	0.43	99	82.4
41			0.00	72.3	0.44	-	82.6
42			0.00	72.2	0.45	-	82.9
43			0.00	72.2	0.44	-	83.1
44			0.00	72.1	0.44	-	83.4
45			0.00	72.1	0.46	-	83.7
46			0.00	72.1	0.44	-	84.2
47			0.00	72.0	0.44	-	84.4
48			0.00	72.0	0.44	-	84.6
49			0.00	72.0	0.45	-	84.9
50	8.476	0.169	0.00	72.1	0.45	100	85.2
51			0.00	72.1	0.46	-	85.3
52			0.00	72.2	0.47	-	85.7
53			0.00	72.1	0.48	-	86.0
54			0.00	72.1	0.49	-	86.1
55			0.00	72.1	0.50	-	86.0
56			0.00	72.2	0.51	-	85.9
57			0.00	72.1	0.51	-	86.0
58			0.00	72.1	0.53	-	86.0
59			0.00	72.2	0.52	-	86.3
60	10.143	0.167	0.00	72.1	0.56	101	86.4
Avg/Tot	10.143	0.169	0.00	72.0	0.42	99	84.4



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	83.3	70.7	71.0	71.0	70.7	73.4	0
1	117.2	70.7	71.9	71.0	70.7	80.3	0
2	163.9	70.7	74.5	71.2	71.0	90.2	0
3	229.2	70.6	78.7	71.8	71.5	104.4	0
4	299.1	70.6	84.7	72.8	72.4	119.9	0
5	365.4	70.7	92.1	74.3	73.9	135.3	0
6	429.7	70.8	100.6	76.5	75.9	150.7	0
7	485.9	71.0	109.9	79.4	78.5	164.9	0
8	535.2	71.4	119.1	83.0	81.7	178.1	0
9	574.6	71.9	127.6	87.6	85.4	189.4	0
10	607.1	72.7	135.6	93.1	89.7	199.7	0
11	625.1	73.9	143.4	99.7	94.5	207.3	0
12	636.5	75.4	150.9	107.0	99.9	213.9	0
13	659.2	77.4	158.2	114.8	105.9	223.1	0
14	680.5	79.7	165.7	122.5	112.3	232.2	0
15	697.9	82.5	173.4	130.0	119.0	240.6	0
16	713.6	85.7	181.4	136.9	126.2	248.7	0
17	727.8	89.2	189.6	143.0	133.8	256.7	0
18	740.7	93.1	197.9	148.7	141.9	264.4	0
19	753.1	97.3	206.7	154.3	150.4	272.3	0
20	763.1	101.9	215.8	161.2	159.1	280.2	0
21	771.6	107.0	225.2	168.6	167.4	287.9	0
22	778.7	112.4	234.4	177.0	175.3	295.6	0
23	784.2	118.1	243.6	185.5	183.5	303.0	0
24	790.0	124.0	253.0	193.9	192.2	310.6	0
25	794.8	130.3	262.2	202.4	201.3	318.2	0
26	801.8	136.8	271.6	210.7	210.3	326.3	0
27	796.7	144.3	282.7	219.2	219.6	332.5	0
28	770.3	151.9	295.4	227.4	228.7	334.7	0
29	759.2	158.8	303.0	235.3	237.3	338.7	0
30	757.5	165.5	305.6	243.1	245.3	343.4	0
31	754.4	172.0	305.6	250.5	252.5	347.0	0
32	750.0	178.3	304.4	257.4	259.1	349.8	0
33	744.8	184.2	302.8	263.7	265.1	352.1	0
34	742.6	189.7	301.0	269.3	270.5	354.6	0
35	739.7	194.8	299.7	274.3	275.2	356.7	0
36	735.9	199.5	298.8	278.7	279.5	358.5	0
37	731.6	203.9	298.1	282.7	283.3	359.9	0
38	728.8	208.1	297.6	286.2	286.8	361.5	0
39	727.2	212.0	297.5	289.4	289.8	363.2	0
40	725.7	215.6	297.5	292.3	292.7	364.8	0
41	725.8	219.0	297.8	295.1	295.3	366.6	0
42	727.1	222.2	298.4	297.7	297.8	368.6	0
43	731.3	225.2	299.3	300.0	300.3	371.2	0
44	738.4	228.1	300.5	302.4	302.7	374.4	0
45	747.3	230.9	302.0	304.6	304.9	377.9	0
46	757.4	233.6	303.8	306.9	307.2	381.8	0
47	768.1	236.3	306.0	309.3	309.6	385.9	0

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	778.8	238.9	308.6	311.8	312.0	390.0	0
49	789.2	241.6	311.4	314.4	314.5	394.2	0
50	800.3	244.2	314.5	317.0	317.1	398.6	0
51	811.7	246.8	317.9	319.8	319.8	403.2	0
52	823.2	249.6	321.6	322.8	322.6	408.0	0
53	834.9	252.3	325.8	325.7	325.4	412.8	0
54	847.4	255.2	330.5	328.9	328.2	418.1	0
55	859.5	258.0	335.9	332.1	331.1	423.3	0
56	870.5	261.0	341.7	335.6	334.1	428.6	0
57	880.8	264.2	348.1	339.3	337.3	433.9	0
58	890.2	267.6	354.6	343.0	340.6	439.2	0
59	899.2	271.0	361.3	346.8	343.8	444.5	0
60	906.6	274.5	368.0	350.8	347.1	449.4	0
61	913.0	278.1	374.5	355.0	350.6	454.2	0
62	918.1	281.9	381.1	359.0	354.2	458.8	0
63	921.7	285.7	387.5	363.2	357.7	463.2	0
64	925.7	289.6	394.1	367.4	361.2	467.6	0
65	929.2	293.6	401.0	371.4	364.7	472.0	0
66	933.5	297.6	408.4	375.6	368.0	476.6	0
67	937.3	301.9	416.4	379.7	371.4	481.3	0
68	939.6	306.2	424.9	383.6	374.8	485.8	0
69	940.3	310.2	433.0	386.7	378.3	489.9	0
70	939.4	313.4	443.6	389.5	381.8	493.5	0
71	937.5	316.5	453.6	392.3	385.2	497.0	0
72	935.3	320.3	464.2	394.9	388.8	500.7	0
73	932.6	324.2	475.5	397.5	392.1	504.4	0
74	929.4	328.2	487.3	400.9	395.6	508.3	0
75	924.9	332.4	499.2	403.6	399.4	511.9	0
76	920.0	336.5	511.1	406.6	402.9	515.4	0
77	912.8	340.9	522.7	409.6	406.4	518.5	0
78	902.3	345.4	533.7	412.4	410.0	520.7	0
79	890.0	350.3	543.1	415.9	413.3	522.5	0
80	875.7	355.3	551.1	419.5	416.6	523.6	0
81	860.0	360.2	557.5	422.7	419.7	524.0	0
82	844.0	365.3	562.8	425.7	422.6	524.1	0
83	828.3	370.4	567.1	428.3	425.5	523.9	0
84	814.4	375.5	570.8	430.6	427.9	523.9	0
85	801.3	380.5	573.8	432.4	429.9	523.6	0
86	790.1	385.6	576.1	434.1	431.7	523.5	0
87	780.5	390.4	578.0	435.2	433.0	523.4	0
88	771.9	395.4	579.6	436.0	434.3	523.4	0
89	764.4	400.2	580.9	436.5	435.3	523.5	0
90	756.5	405.0	582.0	437.0	436.2	523.3	0
91	748.2	409.7	582.5	436.9	436.7	522.8	0
92	740.4	414.6	582.4	437.1	437.3	522.4	0
93	732.3	419.7	581.5	437.2	437.3	521.6	0
94	731.7	420.1	581.4	437.2	437.3	521.5	0
Average	754.6	228.1	338.3	286.7	284.3	378	0

Data from 12/20/22 testing - Reference only

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 3

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

		Sample ID	Tare, mg		Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0122	188.3		190.9	2.6
	<b>B</b>	H0123	188.7		191.4	2.7
	<b>C - 1st Hour</b>	H0124	188.5		190.8	2.3
	<b>Amb</b>	H0148	89.8		89.9	0.1
<b>Probes</b>	<b>A</b>	13A	117314.3		117314.3	0.0
	<b>B</b>	13B	116940.6		116940.6	0.0
	<b>C - 1st Hour</b>	13C	115649.8		115649.9	0.1
<b>O-rings</b>	<b>A</b>	13A	3596.6		3596.6	0.0
	<b>B</b>	13B	3643.1		3643.0	0.0*
	<b>C - 1st Hour</b>	13C	4409.8		4409.8	0.0

\*Negative value corrected to zero

**Placed in Dessicator on:** 12/26/2022

<b>Filters</b>	<b>A</b>	191.2	12/20 2:07	191.0	12/31 11:59	190.9	1/3 9:42		
	<b>B</b>	191.7	12/20 2:07	191.3	12/31 11:59	191.4	1/3 9:42		
	<b>C - 1st Hour</b>	191.2	12/20 2:07	190.9	12/31 11:59	190.8	1/3 9:42		
	<b>Amb</b>	89.8	12/20 2:07	89.9	12/31 12:12	89.9	1/3 9:42		
<b>Probes</b>	<b>A</b>			117314.6	12/31 12:10	117314.3	1/3 9:42	117314.3	1/4 12:20
	<b>B</b>			116940.7	12/31 12:10	116940.6	1/3 9:42		
	<b>C - 1st Hour</b>			115650.0	12/31 12:10	115649.9	1/3 9:42		
<b>O-Rings</b>	<b>A</b>			3596.6	12/31 11:59	3596.6	1/3 9:42		
	<b>B</b>			3643.0	12/31 12:00	3643.0	1/3 9:42		
	<b>C - 1st Hour</b>			4409.8	12/31 12:00	4409.8	1/3 9:42		

<b>Train A Aggregate, mg:</b>	<b>2.6</b>
<b>Train B Aggregate, mg:</b>	<b>2.7</b>
<b>Train C Aggregate, mg:</b>	<b>2.4</b>
<b>Ambient Aggregate, mg:</b>	<b>0.1</b>

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 4 Data Summary**

Client: SBI  
Model: J.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/20/2022

Data from 12/20/2022 testing - reference only

A handwritten signature in black ink, appearing to read "A. J. [unclear]".

\_\_\_\_\_  
Technician Signature

7/12/2023

\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

<b>Burn Rate (kg/hr):</b>	<b>0.88</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	100.442	78.773	79.127	10.284
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.83			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	21033.6			
Average Gas Meter Temperature (°F)	79.6	72.5	71.8	73.0
Total Sample Volume (dscf)	98.803	79.537	79.682	10.131
Average Tunnel Temperature (°F)	88.6			
Total Time of Test (min)	450			
Total Particulate Catch (mg)	0.1	3.7	3.6	2.1
Particulate Concentration, dry-standard (g/dscf)	0.000010	0.0000465	0.0000452	0.0002073
Total PM Emissions (g)	0.16	7.18	6.97	4.34
Particulate Emission Rate (g/hr)	0.02	0.96	0.93	4.34
Emissions Factor (g/kg)	-	1.09	1.06	-
Difference from Average Total Particulate Emissions (g)	-	0.11	0.11	-
Difference from Average Total Particulate Emissions (%)	-	1.5%	1.5%	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	7.07
Particulate Emission Rate (g/hr)	0.94
Emissions Factor (g/kg)	1.07
HHV Efficiency (%)	73.8%
LHV Efficiency (%)	79.0%
CO Emissions (g/min)	0.88

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 81.7/Max: 89.5	OK
Face Velocity	< 30 ft/min	9.6	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:75/Max:89.5	OK
Negative Probe Weight Evaluation	<5% of Total Catch	-4.8%	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/20/22  
**Run:** 4  
**Control #:** 22-835  
**Test Duration:** 450  
**Output Category:** Low

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	73.8%	79.0%
<b>Combustion Efficiency</b>	95.8%	95.8%
<b>Heat Transfer Efficiency</b>	77.0%	82.5%

<b>Output Rate (kJ/h)</b>	12,161	11,536	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	0.88	1.93	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	16,481	15,634	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.57	14.49	<b>dry lb</b>
<b>MC wet (%)</b>	16.62		
<b>MC dry (%)</b>	19.94		
<b>Particulate (g)</b>	7.07		
<b>CO (g)</b>	396		
<b>Test Duration (h)</b>	7.50		

<b>Emissions</b>	<b>Particulate</b>	<b>CO</b>
<b>g/MJ Output</b>	0.08	4.34
<b>g/kg Dry Fuel</b>	1.08	60.18
<b>g/h</b>	0.94	52.76
<b>g/min</b>	0.02	0.88
<b>lb/MM Btu Output</b>	0.18	10.08

<b>Air/Fuel Ratio (A/F)</b>	17.48
-----------------------------	-------

VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/20/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.89  
 Max Allowable Start-up Fuel Weight (lbs): 4.33

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	3.06	In Range	26.8	17.9	18.9	21.2	In Range	2.53	1.15
2	15.83	2.87	In Range	22.0	18.4	18.1	19.5	In Range	2.40	1.09
3	15.75	2.45	In Range	26.6	16.8	18.3	20.6	In Range	2.03	0.92
Core Load Wt. (lbs)		8.38	In Range							

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	2.38	In Range	27.0	14.3	14.2	18.5	In Range	2.01	0.91
2	16.00	3.67	In Range	28.1	16.2	14.9	19.7	In Range	3.06	1.39
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.05	In Range							

Total Load Weight (lbs): 14.43 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: 100% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.0  
 Total Load Average Moisture Content (%DB): 19.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.6  
 Total Test Load Weight (dry basis): 12.03 lbs 5.46 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.84	In Range	10	10	10	10.0	In Range	2.58	1.17

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.19	In Range	24.6	18.8	19.9	21.1	In Range	3.46	1.57

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.4 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 1.97 In Range

## LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/20/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 12  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 17.28  
 Total Load Weight Range (lbs): 16.42 to 18.14  
 Core Load Weight Range (lbs): 7.78 to 11.23  
 Remainder Load Weight Range (lbs): 6.05 to 9.50  
 Core Load Piece Range (lbs): 2.59 to 4.32  
 Remainder Load Piece Range (lbs): 1.73 to 5.18

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	15.75	3.56	In Range	26.3	16.7	17.6	20.2	In Range	2.96	1.34	
2	16.00	3.56	In Range	27.7	22.0	15.8	21.8	In Range	2.92	1.32	
3	16.25	3.49	In Range	25.6	17.2	18.7	20.5	In Range	2.90	1.31	
Core Load Wt. (lbs)		10.61	In Range								

### REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Ave.	Within Spec?	Dry Weight	
				1	2	3				lbs	kg
1	16.00	4.14	In Range	27.0	14.3	15.4	18.9	In Range	3.48	1.58	
2	16.00	2.70	In Range	27.2	15.3	11.1	18.0	In Range	2.29	1.04	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.84	In Range								

Remainder Load Small/Large Piece Weight Ratio: 65% In Range ≤ 67%  
 Total Load Weight (lbs): 17.45 In Range  
 Core Load % of Total Weight: 61% In Range 45-65%  
 Remainder % of Total Weight: 39% In Range 35-55%  
 Total Load % of Target Weight: 101% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 12.1  
 Total Load Average Moisture Content (%DB): 19.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.6  
 Total Test Load Weight (dry basis): 14.55 lbs 6.60 kg

### TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 1.8 to 3.4  
 Actual Charcoal Bed Wt. (lb): 2.81 In Range

### TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.00 Valid Test (≥90%)

Total Fuel Burned During Test Run:  
 17.4 lbs, wet basis  
 14.5 lbs, dry basis  
 6.60 kg, dry basis



## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4  
 Test Start Time: 12:27  
 Test Type: Low Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 450

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.78	29.81	29.80
Relative Humidity (%)	26.4	34.5	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	100.442 ft <sup>3</sup>		

### Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.066	80
2	0.078	80
3	0.076	80
4	0.067	80
5	0.054	80
6	0.072	80
7	0.075	80
8	0.069	80
Center	0.079	80

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 17.71 ft/sec  
 V<sub>scnt</sub>: 18.89 ft/sec  
 F<sub>p</sub>: 0.937 [ratio]

Initial Tunnel Flow: 353.6 scf/min

Static Pressure: -0.165 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 4

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/20/2022

**Low Fire Performed as a continuation of High Fire Test, see Run 3 test data for details**

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.072	0.00	72.3	0.23		17.38		129.6	422.2	86.6	85.4
1			0.074	0.00	72.3	0.23	-	17.33	-0.05	134.3	400.1	86.8	87.8
2			0.069	0.00	72.4	0.25	-	17.10	-0.24	150.3	443.9	87.4	86.1
3			0.072	0.00	72.5	0.23	-	16.81	-0.29	150.1	535.2	87.2	85.0
4			0.074	0.00	72.5	0.23	-	16.64	-0.17	128.7	549.7	84.6	83.9
5			0.075	0.00	72.6	0.23	-	16.43	-0.22	120.3	560.1	84.3	85.5
6			0.075	0.00	72.7	0.21	-	16.21	-0.22	117.4	560.4	84.5	87.8
7			0.074	0.00	72.7	0.23	-	16.05	-0.16	118.0	556.7	84.6	86.2
8			0.075	0.00	72.8	0.22	-	15.87	-0.18	114.8	553.6	84.5	87.8
9			0.075	0.00	72.8	0.22	-	15.68	-0.19	113.6	553.9	84.3	88.7
10	1.726	0.173	0.076	0.00	72.8	0.22	100	15.49	-0.19	112.5	548.0	84.2	88.4
11			0.075	0.00	72.9	0.21	-	15.33	-0.15	112.4	542.6	84.1	87.6
12			0.074	0.00	72.9	0.22	-	15.15	-0.18	112.4	542.8	84.1	87.7
13			0.075	0.00	73.0	0.20	-	14.97	-0.18	119.0	553.6	84.3	88.7
14			0.075	0.00	73.0	0.23	-	14.79	-0.18	116.2	547.5	84.1	88.1
15			0.075	0.00	73.0	0.23	-	14.66	-0.13	112.7	517.5	83.8	88.4
16			0.077	0.00	73.0	0.22	-	14.54	-0.12	110.9	500.0	83.5	87.8
17			0.076	0.00	73.0	0.22	-	14.47	-0.07	106.6	480.7	82.9	87.7
18			0.076	0.00	73.0	0.22	-	14.36	-0.11	104.3	465.7	82.6	89.5
19			0.076	0.00	73.1	0.22	-	14.25	-0.12	105.2	460.6	82.1	88.5
20	3.419	0.169	0.076	0.00	73.1	0.21	100	14.13	-0.12	108.3	459.8	82.0	85.9
21			0.076	0.00	73.1	0.21	-	14.03	-0.10	108.5	459.1	81.7	84.7
22			0.077	0.00	73.1	0.22	-	13.93	-0.10	108.5	457.8	82.2	84.4
23			0.078	0.00	73.1	0.20	-	13.83	-0.10	108.1	457.1	82.9	84.3
24			0.077	0.00	73.1	0.21	-	13.74	-0.08	108.6	456.9	83.4	84.0
25			0.078	0.00	73.2	0.22	-	13.67	-0.07	108.3	456.8	83.9	84.1
26			0.077	0.00	73.2	0.22	-	13.58	-0.09	107.2	455.5	84.2	82.5
27			0.077	0.00	73.2	0.21	-	13.49	-0.09	106.1	454.5	84.5	82.7
28			0.077	0.00	73.2	0.20	-	13.42	-0.07	105.7	453.7	85.1	82.2
29			0.077	0.00	73.2	0.20	-	13.31	-0.11	105.3	454.1	85.4	82.7
30	5.118	0.170	0.077	0.00	73.2	0.21	100	13.19	-0.12	104.9	453.1	85.7	81.0
31			0.076	0.00	73.1	0.23	-	13.09	-0.10	104.5	453.9	85.9	82.2
32			0.077	0.00	73.1	0.21	-	12.97	-0.12	104.5	454.6	86.1	82.0

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.077	0.00	73.0	0.21	-	12.84	-0.13	104.5	455.7	86.2	82.2
34			0.077	0.00	73.0	0.21	-	12.73	-0.11	103.5	456.9	86.0	81.0
35			0.077	0.00	73.0	0.21	-	12.60	-0.13	102.8	457.7	85.8	81.4
36			0.077	0.00	73.0	0.20	-	12.48	-0.13	102.3	459.0	85.5	81.8
37			0.076	0.00	73.0	0.20	-	12.33	-0.14	102.0	461.3	85.3	81.3
38			0.078	0.00	73.1	0.20	-	12.19	-0.14	102.0	464.0	85.2	81.3
39			0.077	0.00	73.1	0.21	-	12.05	-0.14	101.9	466.9	85.1	80.4
40	6.821	0.170	0.078	0.00	73.1	0.21	99	11.91	-0.14	101.8	470.1	85.0	81.0
41			0.076	0.00	73.1	0.22	-	11.78	-0.13	101.9	471.4	85.0	80.3
42			0.076	0.00	73.1	0.22	-	11.63	-0.15	101.8	472.2	85.0	81.1
43			0.079	0.00	73.1	0.23	-	11.49	-0.14	101.6	472.1	84.9	81.1
44			0.078	0.00	73.1	0.23	-	11.35	-0.14	101.5	473.6	84.9	80.5
45			0.077	0.00	73.0	0.22	-	11.21	-0.14	101.5	474.1	84.9	81.0
46			0.078	0.00	73.1	0.24	-	11.07	-0.14	101.4	473.2	84.8	80.9
47			0.076	0.00	73.1	0.23	-	10.94	-0.13	101.3	472.9	84.7	80.3
48			0.076	0.00	73.1	0.23	-	10.80	-0.13	101.2	473.1	84.6	81.2
49			0.076	0.00	73.0	0.23	-	10.65	-0.16	101.2	474.4	84.6	80.2
50	8.551	0.173	0.076	0.00	73.1	0.23	101	10.52	-0.13	101.2	474.6	84.4	81.0
51			0.077	0.00	73.0	0.24	-	10.38	-0.14	101.0	474.4	84.4	80.3
52			0.076	0.00	72.9	0.24	-	10.25	-0.13	101.1	475.8	84.3	80.7
53			0.077	0.00	72.9	0.23	-	10.09	-0.15	100.9	477.2	84.2	80.2
54			0.078	0.00	72.9	0.25	-	9.94	-0.15	100.8	475.8	84.3	80.1
55			0.078	0.00	72.9	0.25	-	9.80	-0.14	100.7	475.2	84.5	80.0
56			0.079	0.00	73.0	0.25	-	9.66	-0.13	100.6	475.2	84.7	80.8
57			0.077	0.00	73.1	0.26	-	9.55	-0.11	100.5	474.5	85.0	79.6
58			0.077	0.00	73.1	0.28	-	9.41	-0.15	100.5	474.0	84.9	80.2
59			0.077	0.00	73.1	0.28	-	9.27	-0.14	100.5	473.0	84.9	80.7
60	10.284	0.173	0.077	0.00	73.1	0.28	102	9.14	-0.13	100.5	472.9	85.2	80.2
61			0.077	0.00	73.1	0.29	-	9.02	-0.12	100.3	472.1	85.2	80.8
62			0.077	0.00	73.1	0.30	-	8.88	-0.13	100.5	470.3	85.2	80.1
63			0.078	0.00	73.2	0.32	-	8.75	-0.13	100.3	470.0	85.2	79.2
64			0.079	0.00	73.3	0.34	-	8.63	-0.13	100.3	468.0	85.4	80.4
65			0.079	0.00	73.4	0.35	-	8.52	-0.11	100.0	466.0	85.5	79.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.079	0.00	73.4	0.33	-	8.38	-0.14	99.9	462.5	85.5	80.5
67			0.078	0.00	73.5	0.35	-	8.27	-0.12	100.1	461.0	85.5	79.9
68			0.078	0.00	73.5	0.36	-	8.14	-0.12	99.6	460.0	85.6	79.5
69			0.079	0.00	73.5	0.37	-	8.02	-0.12	99.5	458.6	85.6	79.8
70	12.005	0.172	0.078	0.00	73.5	0.37	100	7.91	-0.11	99.6	458.8	85.6	80.1
71			0.078	0.00	73.5	0.37	-	7.78	-0.12	99.4	457.3	85.5	80.5
72			0.078	0.00	73.6	0.40	-	7.65	-0.13	99.3	456.1	85.7	80.5
73			0.077	0.00	73.5	0.40	-	7.54	-0.11	99.2	454.6	85.4	80.0
74			0.076	0.00	73.6	0.41	-	7.42	-0.12	99.2	452.4	85.3	80.4
75			0.080	0.00	73.6	0.42	-	7.30	-0.13	98.7	451.3	85.2	79.9
76			0.078	0.00	73.7	0.42	-	7.18	-0.12	98.6	447.5	85.0	80.0
77			0.080	0.00	73.8	0.42	-	7.06	-0.11	98.5	444.8	84.8	80.7
78			0.077	0.00	73.8	0.45	-	6.95	-0.11	98.1	442.2	84.9	79.9
79			0.077	0.00	73.8	0.43	-	6.83	-0.12	98.2	439.5	84.8	79.9
80	13.736	0.173	0.077	0.00	73.7	0.44	100	6.73	-0.10	97.9	436.9	84.5	79.2
81			0.078	0.00	73.7	0.45	-	6.63	-0.11	97.8	435.1	84.3	80.2
82			0.077	0.00	73.6	0.45	-	6.51	-0.11	97.5	432.7	84.1	79.2
83			0.078	0.00	73.5	0.45	-	6.40	-0.11	97.5	431.3	83.9	80.0
84			0.078	0.00	73.5	0.44	-	6.29	-0.11	97.3	431.3	83.8	79.1
85			0.077	0.00	73.4	0.45	-	6.19	-0.10	97.3	431.0	83.9	79.6
86			0.077	0.00	73.3	0.47	-	6.12	-0.07	97.2	430.6	84.0	80.0
87			0.077	0.00	73.2	0.47	-	6.02	-0.10	97.1	431.6	84.2	79.7
88			0.077	0.00	73.2	0.45	-	5.92	-0.10	97.0	432.6	84.2	79.8
89			0.078	0.00	73.2	0.46	-	5.83	-0.09	97.0	433.3	84.3	80.2
90	15.476	0.174	0.079	0.00	73.2	0.46	101	5.73	-0.10	97.1	432.7	84.3	79.7
91			0.078	0.00	73.2	0.47	-	5.62	-0.11	97.1	432.4	84.5	79.1
92			0.078	0.00	73.2	0.47	-	5.50	-0.11	97.0	433.0	84.5	79.4
93			0.079	0.00	73.1	0.46	-	5.39	-0.11	97.5	433.2	84.5	79.3
94			0.078	0.00	73.1	0.47	-	5.29	-0.11	98.6	433.1	84.8	80.5
95			0.077	0.00	73.2	0.47	-	5.18	-0.10	99.3	433.7	84.9	81.1
96			0.078	0.00	73.1	0.48	-	5.08	-0.11	100.0	433.8	84.9	81.4
97			0.077	0.00	73.1	0.49	-	4.98	-0.10	100.2	433.6	85.0	81.6
98			0.077	0.00	73.1	0.49	-	4.89	-0.09	100.5	432.6	85.2	81.6

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.077	0.00	73.0	0.49	-	4.80	-0.09	100.6	431.3	85.2	82.1
100	17.204	0.173	0.076	0.00	73.0	0.49	100	4.72	-0.08	100.9	430.1	85.3	82.1
101			0.076	0.00	73.0	0.50	-	4.63	-0.10	100.9	427.2	85.5	82.0
102			0.078	0.00	73.0	0.49	-	4.58	-0.05	100.5	422.5	85.4	81.1
103			0.076	0.00	73.0	0.49	-	4.51	-0.07	100.2	416.1	85.6	81.5
104			0.077	0.00	72.9	0.51	-	4.45	-0.06	99.9	409.3	85.7	81.7
105			0.076	0.00	72.9	0.50	-	4.38	-0.07	99.8	404.3	85.8	82.4
106			0.077	0.00	72.9	0.50	-	4.32	-0.06	99.5	399.3	85.9	82.6
107			0.078	0.00	73.0	0.50	-	4.28	-0.04	99.4	394.6	86.0	82.9
108			0.077	0.00	73.0	0.49	-	4.21	-0.07	99.2	391.5	86.2	82.4
109			0.078	0.00	73.0	0.49	-	4.18	-0.03	99.1	388.9	86.1	82.5
110	18.949	0.175	0.077	0.00	72.9	0.50	102	4.13	-0.05	98.9	384.8	86.2	82.4
111			0.077	0.00	72.9	0.50	-	4.10	-0.03	98.7	377.8	86.1	82.5
112			0.077	0.00	72.8	0.49	-	4.08	-0.02	98.3	367.4	86.2	82.3
113			0.078	0.00	72.8	0.50	-	4.04	-0.04	97.9	355.1	86.1	82.3
114			0.076	0.00	72.8	0.49	-	4.02	-0.02	97.5	346.2	86.1	82.2
115			0.078	0.00	72.8	0.49	-	3.98	-0.04	97.2	338.0	86.1	82.5
116			0.079	0.00	72.8	0.50	-	3.95	-0.03	96.7	331.9	86.1	82.1
117			0.077	0.00	72.7	0.51	-	3.94	-0.01	96.4	326.1	86.2	82.1
118			0.079	0.00	72.8	0.51	-	3.91	-0.03	95.8	320.8	86.1	82.3
119			0.078	0.00	72.7	0.50	-	3.86	-0.05	95.1	316.0	86.1	82.7
120	20.693	0.174	0.079	0.00	72.8	0.51	101	3.84	-0.02	94.9	311.2	86.0	83.2
121			0.078	0.00	72.7	0.52	-	3.81	-0.03	94.6	307.5	86.0	83.4
122			0.078	0.00	72.7	0.52	-	3.77	-0.05	94.5	305.7	85.8	83.4
123			0.078	0.00	72.8	0.55	-	3.74	-0.03	94.3	302.4	85.8	83.3
124			0.078	0.00	72.7	0.55	-	3.70	-0.04	93.2	299.5	85.7	84.6
125			0.079	0.00	72.8	0.56	-	3.66	-0.04	92.6	298.2	85.6	85.4
126			0.079	0.00	72.7	0.58	-	3.62	-0.04	92.5	296.7	85.6	85.6
127			0.078	0.00	72.8	0.58	-	3.59	-0.03	92.3	294.7	85.5	85.8
128			0.077	0.00	72.8	0.60	-	3.56	-0.03	92.1	292.8	85.3	86.1
129			0.079	0.00	72.7	0.62	-	3.54	-0.03	92.1	291.0	85.2	86.3
130	22.424	0.173	0.078	0.00	72.8	0.62	99	3.51	-0.03	92.0	287.5	85.2	86.0
131			0.079	0.00	72.7	0.65	-	3.48	-0.03	91.9	284.5	85.0	86.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132			0.079	0.00	72.8	0.65	-	3.47	-0.01	91.6	282.1	85.0	86.2
133			0.079	0.00	72.7	0.65	-	3.44	-0.02	91.4	279.8	84.9	86.6
134			0.079	0.00	72.7	0.65	-	3.43	-0.02	91.2	277.6	84.8	87.0
135			0.079	0.00	72.6	0.61	-	3.42	-0.01	91.0	275.4	84.7	86.5
136			0.079	0.00	72.7	0.62	-	3.41	-0.01	91.0	273.6	84.7	86.4
137			0.079	0.00	72.7	0.61	-	3.39	-0.02	90.8	271.4	84.6	86.2
138			0.079	0.00	72.6	0.61	-	3.37	-0.01	90.6	269.5	84.5	86.6
139			0.079	0.00	72.7	0.60	-	3.36	-0.02	90.5	267.6	84.4	86.9
140	24.168	0.174	0.079	0.00	72.7	0.60	100	3.34	-0.02	90.4	266.0	84.3	87.1
141			0.078	0.00	72.7	0.60	-	3.33	-0.01	91.6	265.4	84.3	85.3
142			0.078	0.00	72.7	0.59	-	3.34	0.01	92.4	264.9	84.5	83.1
143			0.079	0.00	72.7	0.59	-	3.36	0.02	92.3	263.7	84.6	82.9
144			0.079	0.00	72.7	0.60	-	3.37	0.01	91.9	262.4	84.5	82.2
145			0.080	0.00	72.7	0.58	-	3.38	0.01	91.8	260.7	84.6	82.5
146			0.078	0.00	72.7	0.59	-	3.38	0.01	91.4	259.0	84.6	82.0
147			0.079	0.00	72.7	0.59	-	3.40	0.01	91.2	257.5	84.5	81.8
148			0.080	0.00	72.7	0.58	-	3.37	-0.03	90.4	255.7	84.5	81.3
149			0.079	0.00	72.6	0.58	-	3.35	-0.02	90.0	254.1	84.5	81.6
150	25.925	0.176	0.078	0.00	72.6	0.58	101	3.31	-0.04	90.0	252.8	84.3	81.4
151			0.079	0.00	72.7	0.58	-	3.27	-0.03	90.0	251.3	84.3	82.0
152			0.081	0.00	72.7	0.59	-	3.26	-0.01	90.0	250.4	84.2	82.0
153			0.081	0.00	72.7	0.59	-	3.24	-0.02	89.9	249.3	84.2	81.9
154			0.080	0.00	72.6	0.58	-	3.22	-0.02	89.8	248.3	84.2	81.9
155			0.080	0.00	72.6	0.58	-	3.22	0.00	90.0	247.5	84.2	81.0
156			0.080	0.00	72.7	0.57	-	3.23	0.01	89.9	246.3	84.2	80.6
157			0.081	0.00	72.7	0.58	-	3.23	0.00	89.8	245.5	84.2	81.3
158			0.079	0.00	72.7	0.57	-	3.24	0.01	89.7	244.6	84.3	81.3
159			0.080	0.00	72.6	0.57	-	3.23	-0.01	89.3	243.3	84.2	79.8
160	27.680	0.176	0.080	0.00	72.7	0.56	100	3.22	-0.01	88.5	242.6	84.1	80.4
161			0.079	0.00	72.7	0.56	-	3.23	0.01	87.9	241.4	84.0	80.1
162			0.079	0.00	72.7	0.55	-	3.21	-0.02	87.7	239.7	84.0	79.5
163			0.081	0.00	72.8	0.56	-	3.21	0.00	87.3	238.5	83.9	79.8
164			0.080	0.00	72.8	0.54	-	3.20	-0.01	87.0	237.2	83.9	79.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165			0.080	0.00	72.8	0.56	-	3.17	-0.03	86.8	235.9	83.8	80.2
166			0.082	0.00	72.7	0.55	-	3.17	-0.01	86.6	234.7	83.9	79.5
167			0.080	0.00	72.8	0.56	-	3.15	-0.02	86.5	233.7	83.9	79.2
168			0.080	0.00	72.8	0.55	-	3.14	-0.01	86.4	232.6	83.9	79.7
169			0.080	0.00	72.8	0.56	-	3.14	0.00	86.3	231.7	83.8	79.9
170	29.434	0.175	0.081	0.00	72.8	0.55	99	3.12	-0.02	86.1	230.5	83.5	79.4
171			0.081	0.00	72.8	0.55	-	3.09	-0.02	85.9	229.8	83.5	79.3
172			0.079	0.00	72.7	0.55	-	3.09	-0.01	85.8	228.7	83.4	79.1
173			0.081	0.00	72.6	0.55	-	3.08	-0.01	85.6	227.8	83.3	78.7
174			0.080	0.00	72.7	0.56	-	3.05	-0.02	85.5	226.9	83.2	79.0
175			0.081	0.00	72.7	0.56	-	3.05	0.00	85.4	226.4	83.1	79.4
176			0.080	0.00	72.7	0.54	-	3.01	-0.04	85.2	225.4	83.1	78.9
177			0.080	0.00	72.6	0.55	-	2.97	-0.04	85.5	224.3	83.0	79.5
178			0.080	0.00	72.5	0.55	-	2.93	-0.04	85.7	223.6	82.9	79.8
179			0.081	0.00	72.6	0.56	-	2.90	-0.03	85.9	223.0	82.9	79.9
180	31.189	0.176	0.080	0.00	72.7	0.55	99	2.88	-0.02	85.9	222.5	82.9	79.9
181			0.080	0.00	72.7	0.56	-	2.85	-0.03	86.0	222.2	82.8	79.9
182			0.080	0.00	72.7	0.55	-	2.83	-0.02	86.0	221.6	82.6	79.8
183			0.080	0.00	72.7	0.55	-	2.80	-0.03	85.9	221.1	82.5	79.8
184			0.079	0.00	72.7	0.55	-	2.78	-0.02	85.9	220.3	82.5	79.6
185			0.081	0.00	72.7	0.55	-	2.76	-0.02	86.0	220.1	82.4	80.1
186			0.079	0.00	72.7	0.55	-	2.74	-0.02	85.9	219.5	82.4	79.8
187			0.079	0.00	72.7	0.55	-	2.73	-0.02	85.8	219.2	82.4	79.8
188			0.080	0.00	72.7	0.55	-	2.71	-0.02	85.8	218.9	82.3	79.8
189			0.080	0.00	72.8	0.56	-	2.69	-0.02	85.7	218.5	82.2	79.8
190	32.951	0.176	0.080	0.00	72.7	0.56	100	2.68	-0.01	85.8	217.9	82.2	79.7
191			0.080	0.00	72.7	0.56	-	2.66	-0.02	85.7	217.3	82.2	79.8
192			0.080	0.00	72.7	0.55	-	2.65	-0.01	85.7	217.3	82.1	79.7
193			0.080	0.00	72.6	0.57	-	2.63	-0.02	85.6	216.9	82.1	79.7
194			0.081	0.00	72.7	0.56	-	2.61	-0.02	85.6	216.6	82.1	79.6
195			0.081	0.00	72.6	0.57	-	2.59	-0.01	85.5	216.2	82.2	79.6
196			0.080	0.00	72.6	0.57	-	2.58	-0.01	85.4	216.0	82.2	80.0
197			0.080	0.00	72.6	0.57	-	2.57	-0.01	85.4	215.5	82.2	79.6



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198			0.081	0.00	72.5	0.56	-	2.55	-0.02	85.2	215.0	82.1	79.7
199			0.079	0.00	72.5	0.56	-	2.53	-0.02	85.3	214.9	82.1	79.7
200	34.715	0.176	0.080	0.00	72.6	0.57	100	2.51	-0.02	85.3	214.3	82.2	79.8
201			0.080	0.00	72.6	0.56	-	2.50	-0.01	85.3	213.9	82.3	79.8
202			0.080	0.00	72.6	0.57	-	2.49	-0.01	85.2	213.6	82.4	79.7
203			0.079	0.00	72.6	0.57	-	2.47	-0.02	85.2	212.9	82.3	79.8
204			0.080	0.00	72.5	0.57	-	2.47	0.00	85.1	212.5	82.2	79.7
205			0.079	0.00	72.5	0.56	-	2.44	-0.03	85.0	212.2	82.2	79.7
206			0.080	0.00	72.5	0.57	-	2.44	0.00	84.9	211.7	82.1	79.7
207			0.080	0.00	72.5	0.56	-	2.42	-0.01	84.8	211.4	82.1	79.9
208			0.081	0.00	72.5	0.56	-	2.40	-0.02	84.8	210.9	82.1	79.6
209			0.080	0.00	72.5	0.57	-	2.39	-0.01	84.7	210.6	82.1	79.9
210	36.484	0.177	0.079	0.00	72.5	0.57	100	2.39	-0.01	84.8	210.2	82.1	79.6
211			0.079	0.00	72.5	0.57	-	2.37	-0.02	84.7	209.9	82.5	79.8
212			0.080	0.00	72.5	0.57	-	2.34	-0.02	84.7	209.4	83.1	79.5
213			0.079	0.00	72.6	0.58	-	2.33	-0.01	84.6	209.1	83.8	79.6
214			0.079	0.00	72.6	0.57	-	2.32	-0.01	84.6	208.7	84.2	79.6
215			0.079	0.00	72.6	0.58	-	2.31	-0.02	84.5	208.3	84.7	79.6
216			0.079	0.00	72.6	0.58	-	2.30	-0.01	84.5	208.0	85.0	79.6
217			0.079	0.00	72.6	0.58	-	2.29	-0.01	84.5	207.6	85.4	79.5
218			0.079	0.00	72.6	0.58	-	2.27	-0.01	84.4	207.2	85.7	79.4
219			0.080	0.00	72.6	0.58	-	2.26	-0.01	84.3	207.1	85.9	79.6
220	38.248	0.176	0.079	0.00	72.6	0.59	100	2.24	-0.01	84.4	206.8	86.1	79.3
221			0.079	0.00	72.5	0.59	-	2.23	-0.02	84.3	206.5	86.5	79.2
222			0.079	0.00	72.5	0.58	-	2.21	-0.01	84.2	206.4	86.4	79.1
223			0.079	0.00	72.5	0.59	-	2.20	-0.01	84.1	206.1	86.0	79.3
224			0.080	0.00	72.5	0.59	-	2.19	-0.01	84.2	206.0	85.7	79.5
225			0.080	0.00	72.6	0.58	-	2.17	-0.01	84.1	205.3	85.5	79.4
226			0.079	0.00	72.5	0.58	-	2.16	-0.01	84.0	205.2	85.3	79.1
227			0.080	0.00	72.6	0.59	-	2.15	-0.02	84.0	204.8	85.0	79.1
228			0.079	0.00	72.5	0.57	-	2.13	-0.02	84.0	204.4	85.0	79.3
229			0.079	0.00	72.5	0.59	-	2.13	0.00	83.9	204.0	85.0	79.4
230	40.004	0.176	0.080	0.00	72.5	0.58	100	2.11	-0.02	83.9	204.0	85.1	79.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231			0.079	0.00	72.5	0.59	-	2.10	-0.01	83.8	203.8	85.1	79.1
232			0.079	0.00	72.4	0.59	-	2.08	-0.01	83.8	203.5	84.9	79.1
233			0.080	0.00	72.5	0.58	-	2.08	-0.01	83.7	203.2	84.6	79.2
234			0.079	0.00	72.4	0.59	-	2.06	-0.02	83.6	203.0	84.6	79.1
235			0.080	0.00	72.3	0.59	-	2.04	-0.02	83.7	202.7	84.5	79.0
236			0.079	0.00	72.3	0.58	-	2.04	-0.01	83.6	202.6	84.4	79.2
237			0.079	0.00	72.4	0.56	-	2.03	-0.01	83.6	202.2	84.4	79.2
238			0.080	0.00	72.4	0.58	-	2.01	-0.02	83.6	202.1	84.4	79.1
239			0.080	0.00	72.5	0.59	-	2.00	-0.01	83.4	201.5	84.4	79.3
240	41.757	0.175	0.079	0.00	72.5	0.59	99	1.98	-0.02	83.4	201.5	84.5	79.2
241			0.080	0.00	72.3	0.58	-	1.97	-0.01	83.4	201.1	84.7	79.2
242			0.079	0.00	72.4	0.59	-	1.96	-0.01	83.3	201.1	84.8	79.1
243			0.080	0.00	72.3	0.59	-	1.94	-0.02	83.3	201.0	84.6	79.1
244			0.079	0.00	72.4	0.59	-	1.93	-0.02	83.2	200.4	84.5	79.3
245			0.079	0.00	72.3	0.59	-	1.92	-0.01	83.3	200.3	84.4	79.0
246			0.080	0.00	72.3	0.59	-	1.91	-0.01	83.3	200.1	84.3	79.0
247			0.080	0.00	72.3	0.59	-	1.89	-0.02	83.3	200.1	84.2	78.6
248			0.079	0.00	72.3	0.59	-	1.89	0.00	83.2	199.5	84.1	79.1
249			0.080	0.00	72.4	0.59	-	1.88	-0.01	83.1	199.5	84.1	78.9
250	43.516	0.176	0.080	0.00	72.3	0.60	99	1.85	-0.02	83.1	199.4	83.9	78.8
251			0.081	0.00	72.3	0.61	-	1.85	0.00	83.1	199.1	83.9	78.9
252			0.080	0.00	72.3	0.59	-	1.83	-0.02	83.1	198.9	83.8	79.0
253			0.079	0.00	72.2	0.60	-	1.83	0.00	83.0	198.9	83.7	78.8
254			0.081	0.00	72.3	0.60	-	1.81	-0.02	83.0	198.6	83.6	78.9
255			0.080	0.00	72.2	0.59	-	1.80	-0.01	82.9	198.2	83.4	78.9
256			0.080	0.00	72.2	0.61	-	1.80	0.00	83.0	198.0	83.3	78.8
257			0.081	0.00	72.2	0.61	-	1.77	-0.03	82.9	197.9	83.5	78.6
258			0.080	0.00	72.2	0.61	-	1.76	-0.01	82.8	197.8	83.7	78.5
259			0.080	0.00	72.3	0.60	-	1.74	-0.02	82.8	197.6	83.9	78.7
260	45.286	0.177	0.080	0.00	72.3	0.61	100	1.74	0.00	82.7	197.4	84.0	78.7
261			0.079	0.00	72.4	0.60	-	1.73	-0.01	82.7	197.2	84.0	78.9
262			0.080	0.00	72.3	0.61	-	1.71	-0.02	82.7	197.2	84.1	78.7
263			0.079	0.00	72.3	0.60	-	1.69	-0.02	82.7	196.9	84.1	78.5

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264			0.079	0.00	72.4	0.61	-	1.68	-0.01	82.7	196.8	84.2	78.7
265			0.081	0.00	72.3	0.61	-	1.68	0.00	82.6	196.7	83.9	78.8
266			0.080	0.00	72.2	0.61	-	1.66	-0.02	82.5	196.4	83.9	78.9
267			0.081	0.00	72.2	0.60	-	1.65	-0.01	82.5	196.3	83.9	78.6
268			0.080	0.00	72.2	0.60	-	1.63	-0.01	82.6	196.4	83.8	78.8
269			0.079	0.00	72.3	0.58	-	1.62	-0.01	82.5	196.4	83.7	78.6
270	47.058	0.177	0.079	0.00	72.3	0.59	100	1.62	-0.01	82.5	195.9	83.7	78.4
271			0.079	0.00	72.2	0.59	-	1.61	-0.01	82.5	196.0	83.6	78.4
272			0.079	0.00	72.3	0.60	-	1.58	-0.02	82.4	195.9	83.4	78.5
273			0.080	0.00	72.2	0.59	-	1.58	-0.01	82.4	195.8	83.3	78.8
274			0.080	0.00	72.2	0.60	-	1.57	-0.01	82.4	195.8	83.2	78.3
275			0.080	0.00	72.2	0.60	-	1.56	-0.01	82.4	195.7	83.3	78.5
276			0.079	0.00	72.2	0.61	-	1.54	-0.02	82.4	195.6	83.1	78.9
277			0.080	0.00	72.2	0.60	-	1.53	-0.01	82.3	195.4	83.1	78.5
278			0.080	0.00	72.1	0.61	-	1.51	-0.02	82.4	195.2	83.0	78.6
279			0.080	0.00	72.2	0.61	-	1.51	-0.01	82.3	195.1	83.0	78.6
280	48.823	0.176	0.079	0.00	72.2	0.61	100	1.49	-0.02	82.3	194.8	83.0	78.3
281			0.080	0.00	72.2	0.62	-	1.49	-0.01	82.2	194.7	82.9	78.4
282			0.080	0.00	72.2	0.61	-	1.47	-0.01	82.2	194.9	82.8	78.4
283			0.081	0.00	72.3	0.61	-	1.46	-0.01	82.1	194.7	82.9	78.3
284			0.080	0.00	72.3	0.61	-	1.46	0.00	82.2	194.6	82.8	78.1
285			0.079	0.00	72.3	0.62	-	1.44	-0.02	82.3	194.4	82.8	78.6
286			0.079	0.00	72.3	0.63	-	1.45	0.01	82.4	194.4	82.9	78.4
287			0.080	0.00	72.3	0.62	-	1.45	0.00	82.4	194.3	83.0	78.8
288			0.080	0.00	72.3	0.62	-	1.44	-0.01	82.3	194.5	83.0	78.4
289			0.079	0.00	72.3	0.62	-	1.44	0.01	82.3	194.3	83.0	78.2
290	50.586	0.176	0.080	0.00	72.3	0.62	100	1.43	-0.01	82.3	194.1	83.1	78.3
291			0.081	0.00	72.4	0.62	-	1.42	-0.02	82.2	194.1	83.0	78.3
292			0.080	0.00	72.4	0.62	-	1.42	0.00	82.2	193.7	83.1	78.0
293			0.080	0.00	72.3	0.62	-	1.41	0.00	82.1	193.7	83.1	78.0
294			0.080	0.00	72.2	0.61	-	1.40	-0.02	82.1	193.4	83.1	78.1
295			0.080	0.00	72.2	0.61	-	1.38	-0.01	82.1	193.5	83.1	78.1
296			0.080	0.00	72.2	0.61	-	1.37	-0.02	82.1	193.3	83.2	78.1

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297			0.081	0.00	72.1	0.62	-	1.36	0.00	82.1	193.4	83.1	78.0
298			0.079	0.00	72.1	0.61	-	1.35	-0.01	82.0	193.0	83.3	77.8
299			0.080	0.00	72.1	0.62	-	1.33	-0.02	81.9	193.2	83.4	78.0
300	52.365	0.178	0.079	0.00	72.1	0.63	101	1.33	0.00	81.8	193.0	83.4	77.8
301			0.080	0.00	72.1	0.62	-	1.31	-0.02	81.9	192.7	83.5	77.8
302			0.079	0.00	72.2	0.62	-	1.30	-0.02	81.8	192.8	83.5	77.9
303			0.079	0.00	72.1	0.62	-	1.28	-0.02	81.8	192.8	83.5	77.9
304			0.080	0.00	72.1	0.62	-	1.27	-0.01	81.8	192.6	83.4	77.8
305			0.080	0.00	72.1	0.63	-	1.26	-0.01	81.8	192.7	83.6	77.6
306			0.080	0.00	72.1	0.63	-	1.25	-0.01	81.8	192.5	83.6	77.6
307			0.079	0.00	72.1	0.62	-	1.24	-0.01	81.8	192.5	83.6	77.7
308			0.080	0.00	72.1	0.62	-	1.23	-0.02	81.8	192.4	83.6	78.2
309			0.081	0.00	72.0	0.62	-	1.21	-0.02	81.7	192.5	83.5	77.9
310	54.132	0.177	0.080	0.00	72.0	0.62	100	1.20	-0.01	81.8	192.5	83.6	78.0
311			0.079	0.00	72.0	0.62	-	1.19	-0.01	81.8	192.4	83.7	77.9
312			0.079	0.00	72.0	0.61	-	1.18	-0.01	81.7	192.2	83.7	77.9
313			0.080	0.00	72.0	0.63	-	1.17	0.00	81.6	192.0	83.7	77.6
314			0.080	0.00	72.0	0.63	-	1.16	-0.01	81.6	192.0	83.7	77.9
315			0.081	0.00	71.9	0.62	-	1.15	-0.02	81.6	191.8	83.6	77.6
316			0.079	0.00	71.8	0.63	-	1.14	-0.01	81.6	191.8	83.7	77.7
317			0.080	0.00	71.9	0.62	-	1.12	-0.01	81.5	191.6	83.7	77.5
318			0.081	0.00	71.8	0.62	-	1.11	-0.01	81.5	191.5	83.6	77.8
319			0.080	0.00	71.9	0.62	-	1.10	-0.01	81.4	191.4	83.7	77.7
320	55.886	0.175	0.080	0.00	71.9	0.63	99	1.09	-0.01	81.5	191.2	83.7	77.5
321			0.080	0.00	71.8	0.64	-	1.08	-0.01	81.4	191.2	83.7	77.6
322			0.080	0.00	71.8	0.65	-	1.07	-0.01	81.4	191.2	83.8	77.7
323			0.080	0.00	71.8	0.65	-	1.06	-0.01	81.4	191.1	83.9	77.7
324			0.080	0.00	71.8	0.64	-	1.04	-0.02	81.4	190.8	83.9	77.5
325			0.080	0.00	71.8	0.65	-	1.04	0.00	81.4	190.7	83.9	77.4
326			0.079	0.00	71.9	0.64	-	1.03	-0.01	81.4	190.3	83.8	77.5
327			0.080	0.00	72.0	0.64	-	1.02	-0.01	81.3	190.1	83.7	77.5
328			0.079	0.00	72.0	0.65	-	1.00	-0.01	81.2	190.1	83.6	77.5
329			0.078	0.00	71.9	0.65	-	0.99	-0.01	81.3	189.7	83.6	77.6

# BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	57.657	0.177	0.080	0.00	72.0	0.65	100	0.98	0.00	81.3	189.6	83.6	77.4
331			0.079	0.00	71.9	0.64	-	0.98	0.00	81.3	189.5	83.6	77.4
332			0.079	0.00	71.9	0.64	-	0.96	-0.02	81.2	189.5	83.4	77.2
333			0.080	0.00	71.9	0.66	-	0.95	-0.01	81.2	189.3	83.4	77.1
334			0.081	0.00	71.8	0.65	-	0.94	-0.01	81.1	189.0	83.4	77.3
335			0.079	0.00	71.9	0.64	-	0.93	-0.01	81.1	188.9	83.4	77.4
336			0.080	0.00	71.9	0.65	-	0.92	-0.01	81.1	188.7	83.4	77.1
337			0.081	0.00	71.9	0.65	-	0.91	0.00	81.0	188.3	83.4	77.2
338			0.080	0.00	71.9	0.64	-	0.90	-0.02	81.0	188.3	83.2	77.5
339			0.080	0.00	71.8	0.64	-	0.89	-0.01	81.1	188.0	83.3	77.3
340	59.429	0.177	0.080	0.00	71.9	0.65	100	0.88	-0.01	81.0	187.9	83.3	77.4
341			0.079	0.00	71.8	0.65	-	0.87	-0.01	81.0	187.8	83.3	77.4
342			0.079	0.00	71.8	0.65	-	0.86	-0.01	80.9	187.3	83.4	77.2
343			0.079	0.00	71.8	0.65	-	0.83	-0.02	80.9	186.9	83.4	77.1
344			0.079	0.00	71.8	0.65	-	0.83	-0.01	80.9	186.6	83.5	77.2
345			0.079	0.00	71.8	0.64	-	0.82	-0.01	80.8	186.3	83.4	77.3
346			0.079	0.00	71.8	0.64	-	0.81	-0.01	80.7	185.9	83.4	77.0
347			0.078	0.00	71.8	0.64	-	0.80	-0.02	80.7	185.6	83.3	77.1
348			0.079	0.00	71.8	0.64	-	0.79	-0.01	80.7	185.6	83.2	77.1
349			0.079	0.00	71.8	0.64	-	0.79	0.00	80.7	185.4	83.3	77.2
350	61.189	0.176	0.079	0.00	71.8	0.64	100	0.78	-0.01	80.6	185.1	83.2	77.0
351			0.079	0.00	71.7	0.65	-	0.76	-0.01	80.7	184.8	83.2	77.3
352			0.079	0.00	71.8	0.65	-	0.77	0.00	80.7	184.4	83.2	77.2
353			0.080	0.00	71.7	0.66	-	0.76	-0.01	80.6	184.2	83.2	77.1
354			0.079	0.00	71.8	0.64	-	0.74	-0.01	80.5	183.9	83.1	76.9
355			0.079	0.00	71.8	0.65	-	0.73	-0.01	80.6	183.5	83.1	77.1
356			0.079	0.00	71.7	0.64	-	0.72	-0.01	80.5	183.3	83.1	77.2
357			0.079	0.00	71.7	0.65	-	0.72	-0.01	80.5	183.3	83.1	76.9
358			0.079	0.00	71.8	0.66	-	0.70	-0.01	80.5	182.9	83.1	77.2
359			0.080	0.00	71.8	0.66	-	0.70	0.00	80.5	183.2	83.1	77.1
360	62.944	0.176	0.079	0.00	71.8	0.66	100	0.68	-0.02	80.5	183.3	83.1	76.9
361			0.080	0.00	71.7	0.67	-	0.67	-0.01	80.4	183.1	83.1	76.7
362			0.080	0.00	71.7	0.68	-	0.66	-0.01	80.4	182.8	83.3	77.0

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363			0.080	0.00	71.8	0.68	-	0.64	-0.02	80.3	182.6	83.3	77.0
364			0.080	0.00	71.8	0.68	-	0.63	-0.01	80.3	182.7	83.2	76.9
365			0.080	0.00	71.9	0.69	-	0.63	0.00	80.3	182.8	83.0	76.9
366			0.079	0.00	72.0	0.69	-	0.62	-0.01	80.3	182.7	83.1	77.0
367			0.079	0.00	71.9	0.67	-	0.60	-0.02	80.2	182.7	83.1	76.9
368			0.079	0.00	72.0	0.68	-	0.59	-0.02	80.2	182.6	83.1	76.8
369			0.079	0.00	72.0	0.68	-	0.58	-0.01	80.2	182.4	83.0	76.9
370	64.716	0.177	0.079	0.00	72.0	0.68	100	0.58	0.01	80.2	182.3	83.0	76.9
371			0.079	0.00	71.9	0.67	-	0.57	-0.01	80.2	182.0	83.0	77.0
372			0.081	0.00	71.9	0.69	-	0.56	-0.01	80.2	181.6	83.0	77.1
373			0.080	0.00	72.0	0.69	-	0.54	-0.01	80.1	181.7	83.0	77.0
374			0.080	0.00	72.0	0.69	-	0.54	0.00	80.1	181.5	83.0	77.1
375			0.080	0.00	72.0	0.70	-	0.53	-0.01	80.1	181.3	83.0	77.1
376			0.080	0.00	72.1	0.72	-	0.52	-0.01	80.1	181.1	83.0	77.2
377			0.081	0.00	72.1	0.72	-	0.51	-0.01	80.1	181.0	83.0	77.0
378			0.080	0.00	72.1	0.72	-	0.51	-0.01	80.1	180.8	83.0	77.0
379			0.079	0.00	72.1	0.72	-	0.50	-0.01	80.0	180.7	82.9	76.9
380	66.465	0.175	0.080	0.00	72.1	0.72	99	0.49	-0.01	80.0	180.5	83.0	77.0
381			0.079	0.00	72.1	0.74	-	0.48	-0.01	80.0	180.2	83.0	76.7
382			0.081	0.00	72.0	0.73	-	0.48	0.00	80.0	180.0	83.0	77.0
383			0.081	0.00	72.1	0.74	-	0.47	-0.01	79.9	179.7	82.9	76.7
384			0.079	0.00	72.1	0.74	-	0.46	-0.01	79.9	179.6	83.0	77.0
385			0.081	0.00	72.1	0.74	-	0.45	-0.01	79.9	179.6	83.0	76.5
386			0.080	0.00	72.0	0.74	-	0.44	-0.01	79.9	179.5	82.9	76.6
387			0.081	0.00	72.1	0.73	-	0.44	0.00	79.8	179.3	82.9	76.9
388			0.080	0.00	72.2	0.74	-	0.42	-0.01	79.8	179.0	82.9	76.9
389			0.080	0.00	72.2	0.74	-	0.42	0.00	79.8	178.8	83.0	77.1
390	68.228	0.176	0.080	0.00	72.3	0.74	99	0.40	-0.02	79.7	178.5	82.9	76.8
391			0.078	0.00	72.3	0.74	-	0.41	0.00	79.6	178.5	82.8	76.8
392			0.074	0.00	72.4	0.74	-	0.39	-0.01	79.7	178.4	82.9	77.0
393			0.081	0.00	72.4	0.74	-	0.38	-0.01	79.6	178.1	83.0	77.1
394			0.080	0.00	72.4	0.75	-	0.37	-0.02	79.6	178.1	82.9	76.9
395			0.079	0.00	72.5	0.74	-	0.37	0.00	79.6	178.1	82.8	76.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396			0.079	0.00	72.5	0.75	-	0.36	-0.01	79.6	177.8	82.9	76.8
397			0.080	0.00	72.5	0.75	-	0.35	0.00	79.7	177.6	82.9	76.7
398			0.081	0.00	72.4	0.75	-	0.34	-0.01	79.7	177.5	83.0	76.8
399			0.079	0.00	72.5	0.74	-	0.33	-0.01	79.6	177.3	82.9	76.8
400	69.976	0.175	0.079	0.00	72.5	0.76	99	0.32	0.00	79.6	177.0	82.9	76.9
401			0.079	0.00	72.4	0.78	-	0.32	-0.01	79.6	176.6	82.9	76.8
402			0.079	0.00	72.5	0.79	-	0.31	-0.01	79.6	176.5	82.9	76.8
403			0.079	0.00	72.4	0.79	-	0.30	-0.01	79.6	176.5	82.8	76.8
404			0.079	0.00	72.4	0.79	-	0.30	0.00	79.5	176.3	82.7	76.7
405			0.079	0.00	72.4	0.78	-	0.29	-0.01	79.4	176.0	82.7	76.6
406			0.081	0.00	72.3	0.79	-	0.28	-0.01	79.4	176.0	82.8	76.8
407			0.080	0.00	72.4	0.80	-	0.27	-0.01	79.4	175.7	82.8	76.8
408			0.079	0.00	72.4	0.79	-	0.26	0.00	79.4	175.6	82.7	76.8
409			0.079	0.00	72.3	0.80	-	0.25	-0.01	79.4	175.4	82.6	76.7
410	71.739	0.176	0.079	0.00	72.3	0.79	100	0.24	-0.01	79.3	175.2	82.5	76.6
411			0.080	0.00	72.3	0.80	-	0.24	-0.01	79.3	175.2	82.5	76.7
412			0.081	0.00	72.2	0.79	-	0.23	0.00	79.3	174.8	82.6	76.6
413			0.079	0.00	72.1	0.81	-	0.22	-0.01	79.2	174.7	82.8	76.7
414			0.079	0.00	72.2	0.81	-	0.22	-0.01	79.3	174.6	83.4	76.4
415			0.081	0.00	72.2	0.81	-	0.21	-0.01	79.2	174.4	84.0	76.6
416			0.079	0.00	72.2	0.82	-	0.20	-0.01	79.3	174.2	84.6	76.5
417			0.080	0.00	72.2	0.81	-	0.19	-0.01	79.3	174.0	85.0	76.6
418			0.079	0.00	72.2	0.82	-	0.19	0.00	79.2	173.8	85.5	76.7
419			0.080	0.00	72.2	0.81	-	0.18	-0.01	79.2	173.8	86.1	76.6
420	73.507	0.177	0.079	0.00	72.1	0.82	100	0.17	-0.01	79.2	173.6	86.6	76.6
421			0.079	0.00	72.1	0.82	-	0.16	-0.01	79.1	173.3	86.7	76.6
422			0.080	0.00	72.1	0.83	-	0.16	0.00	79.1	172.8	86.4	76.6
423			0.080	0.00	72.1	0.83	-	0.15	-0.01	79.1	172.4	86.1	76.5
424			0.079	0.00	72.1	0.82	-	0.15	0.00	79.1	172.2	85.8	76.4
425			0.080	0.00	72.1	0.82	-	0.15	0.00	79.0	171.7	85.6	76.6
426			0.080	0.00	72.1	0.82	-	0.14	-0.01	79.0	171.4	85.2	76.5
427			0.080	0.00	72.1	0.81	-	0.13	-0.01	78.9	170.9	84.9	76.6
428			0.079	0.00	72.1	0.83	-	0.12	0.00	79.0	170.7	84.8	76.5

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
429			0.080	0.00	72.1	0.82	-	0.12	0.00	78.9	170.4	84.6	76.5
430	75.261	0.175	0.080	0.00	72.1	0.84	99	0.11	-0.01	78.9	169.9	84.3	76.4
431			0.080	0.00	72.2	0.83	-	0.11	0.00	78.9	169.5	84.1	76.4
432			0.079	0.00	72.1	0.84	-	0.10	-0.01	78.8	169.3	83.9	76.5
433			0.080	0.00	72.1	0.82	-	0.09	-0.01	78.8	168.8	83.9	76.4
434			0.080	0.00	72.1	0.83	-	0.09	-0.01	78.9	168.4	83.8	76.5
435			0.080	0.00	72.1	0.84	-	0.08	-0.01	78.8	167.9	83.7	76.5
436			0.080	0.00	72.1	0.84	-	0.07	-0.01	78.7	167.6	83.5	76.5
437			0.080	0.00	72.1	0.84	-	0.07	0.00	78.8	167.2	83.5	76.5
438			0.079	0.00	72.2	0.84	-	0.07	0.00	78.7	166.9	83.3	76.4
439			0.080	0.00	72.1	0.85	-	0.06	-0.01	78.6	166.5	83.3	76.3
440	77.006	0.175	0.080	0.00	72.1	0.85	98	0.06	0.00	78.7	166.1	83.2	76.6
441			0.079	0.00	72.0	0.87	-	0.04	-0.01	78.6	165.7	83.2	76.5
442			0.080	0.00	72.0	0.86	-	0.04	0.00	78.5	165.3	83.1	76.6
443			0.080	0.00	71.9	0.86	-	0.03	-0.01	78.5	165.0	83.1	76.6
444			0.080	0.00	71.9	0.87	-	0.04	0.01	78.5	164.8	83.1	76.5
445			0.081	0.00	71.9	0.87	-	0.02	-0.02	78.4	164.6	83.0	76.1
446			0.080	0.00	72.0	0.88	-	0.03	0.01	78.4	164.4	83.0	76.3
447			0.079	0.00	72.0	0.88	-	0.01	-0.01	78.4	164.0	82.9	76.3
448			0.080	0.00	72.0	0.88	-	0.00	-0.01	78.4	163.6	82.9	76.2
449			0.079	0.00	72.0	0.89	-	0.00	0.00	78.3	163.3	82.8	76.3
450	78.773	0.177	0.081	0.00	71.3	0.89	99	0.00	0.00	76.3	158.0	82.8	75.0
Avg/Tot	78.773	0.175	0.079	0.00	72.5	0.56	100			88.6	269.4	84.0	79.6



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	71.6	0.47		89.5	-0.076	2.20	0.087	11.3	46.4
1			0.00	71.6	0.37	-	89.1	-0.080	2.09	0.176	10.3	50.9
2			0.00	71.7	0.45	-	88.1	-0.101	3.49	0.163	11.9	54.9
3			0.00	71.8	0.37	-	88.4	-0.097	5.69	0.277	11.8	54.7
4			0.00	71.8	0.42	-	86.2	-0.099	12.96	0.105	11.1	53.1
5			0.00	71.8	0.38	-	85.8	-0.100	12.86	0.057	15.9	63.0
6			0.00	71.9	0.46	-	86.1	-0.099	13.58	0.139	17.7	64.6
7			0.00	71.9	0.46	-	86.6	-0.098	12.49	0.109	18.5	63.3
8			0.00	71.9	0.37	-	86.7	-0.097	12.34	0.148	17.8	63.3
9			0.00	71.9	0.45	-	87.0	-0.097	12.43	0.164	19.1	62.1
10	1.740	0.174	0.00	71.9	0.41	104	87.1	-0.097	12.61	0.230	19.6	61.9
11			0.00	72.0	0.39	-	87.2	-0.097	12.32	0.145	19.8	61.2
12			0.00	72.0	0.46	-	87.3	-0.101	12.04	0.122	19.8	61.2
13			0.00	72.0	0.46	-	87.6	-0.099	12.48	0.359	19.7	60.8
14			0.00	72.1	0.38	-	86.2	-0.097	13.38	0.423	17.9	62.4
15			0.00	72.1	0.36	-	85.4	-0.094	13.76	0.366	18.8	62.2
16			0.00	72.1	0.35	-	85.1	-0.093	13.36	0.240	19.4	60.4
17			0.00	72.1	0.40	-	84.7	-0.089	10.61	0.195	19.4	59.4
18			0.00	72.1	0.46	-	84.4	-0.088	10.21	0.271	19.7	56.3
19			0.00	72.1	0.39	-	83.9	-0.089	11.09	0.337	20.2	55.2
20	3.447	0.171	0.00	72.1	0.37	101	84.0	-0.088	11.17	0.303	20.4	55.8
21			0.00	72.1	0.39	-	83.8	-0.088	11.41	0.293	19.2	56.7
22			0.00	72.2	0.44	-	83.7	-0.088	11.57	0.341	19.1	56.7
23			0.00	72.1	0.44	-	83.5	-0.086	11.68	0.375	19.1	56.5
24			0.00	72.2	0.41	-	83.6	-0.087	11.75	0.364	19.1	56.3
25			0.00	72.3	0.44	-	83.5	-0.087	11.91	0.325	18.9	56.5
26			0.00	72.3	0.37	-	83.5	-0.087	11.80	0.259	18.9	56.1
27			0.00	72.4	0.42	-	83.4	-0.087	11.79	0.252	19.2	55.9
28			0.00	72.4	0.41	-	83.3	-0.087	11.89	0.298	19.6	55.6
29			0.00	72.4	0.44	-	83.2	-0.087	12.06	0.343	19.8	55.6
30	5.161	0.171	0.00	72.4	0.43	100	83.2	-0.087	12.27	0.382	20.0	55.4
31			0.00	72.4	0.44	-	82.9	-0.087	12.48	0.451	20.2	55.4
32			0.00	72.4	0.38	-	82.8	-0.087	12.52	0.478	20.4	55.4
33			0.00	72.4	0.43	-	82.9	-0.087	12.69	0.535	20.7	55.8
34			0.00	72.3	0.43	-	82.9	-0.087	12.67	0.475	20.7	55.6
35			0.00	72.3	0.37	-	82.8	-0.087	12.66	0.434	20.9	55.4
36			0.00	72.3	0.35	-	82.7	-0.088	13.32	0.398	21.4	55.2
37			0.00	72.3	0.39	-	82.7	-0.089	13.44	0.541	21.7	55.2
38			0.00	72.4	0.44	-	82.7	-0.089	13.83	0.572	22.0	55.4

Data from 12/20/22 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	72.4	0.44	-	82.6	-0.089	14.13	0.580	22.2	55.6
40	6.868	0.171	0.00	72.4	0.45	99	82.6	-0.090	14.36	0.617	22.4	55.8
41			0.00	72.4	0.45	-	82.6	-0.090	14.06	0.671	22.6	55.9
42			0.00	72.4	0.41	-	82.7	-0.089	14.15	0.547	22.6	55.9
43			0.00	72.4	0.38	-	82.6	-0.089	14.26	0.466	22.5	55.6
44			0.00	72.4	0.42	-	82.6	-0.090	14.36	0.472	22.5	55.6
45			0.00	72.4	0.38	-	82.4	-0.089	14.06	0.429	22.5	55.6
46			0.00	72.4	0.44	-	82.2	-0.089	13.87	0.545	22.4	55.4
47			0.00	72.4	0.41	-	82.2	-0.089	13.94	0.524	22.4	55.2
48			0.00	72.4	0.43	-	82.3	-0.089	14.06	0.454	22.4	55.2
49			0.00	72.4	0.46	-	82.2	-0.089	14.29	0.350	22.4	55.2
50	8.607	0.174	0.00	72.5	0.44	101	82.2	-0.090	14.03	0.344	22.5	55.2
51			0.00	72.4	0.44	-	82.1	-0.089	14.02	0.296	22.4	55.0
52			0.00	72.4	0.37	-	82.1	-0.090	14.20	0.216	22.3	54.9
53			0.00	72.3	0.40	-	82.1	-0.090	14.33	0.196	22.3	54.9
54			0.00	72.3	0.44	-	82.3	-0.089	14.11	0.246	22.3	54.9
55			0.00	72.4	0.47	-	82.7	-0.089	13.96	0.233	22.2	54.5
56			0.00	72.4	0.44	-	83.0	-0.088	14.09	0.267	22.1	54.5
57			0.00	72.5	0.43	-	83.5	-0.089	14.05	0.305	22.1	54.3
58			0.00	72.5	0.44	-	83.9	-0.089	13.96	0.354	22.2	54.3
59			0.00	72.5	0.47	-	84.2	-0.090	14.03	0.382	22.2	54.3
60	10.337	0.173	0.00	72.5	0.45	101	84.5	-0.088	13.85	0.452	22.2	54.3
61			0.00	72.5	0.52	-	84.6	-0.088	13.82	0.445	22.2	54.3
62			0.00	72.5	0.53	-	84.9	-0.089	13.77	0.483	22.1	54.1
63			0.00	72.6	0.59	-	85.3	-0.089	13.75	0.425	21.9	54.0
64			0.00	72.6	0.61	-	85.6	-0.088	13.74	0.388	21.8	53.8
65			0.00	72.7	0.56	-	85.9	-0.088	13.77	0.421	21.8	53.6
66			0.00	72.7	0.61	-	86.2	-0.088	13.47	0.599	21.8	53.4
67			0.00	72.7	0.57	-	86.4	-0.088	13.62	0.592	21.8	53.2
68			0.00	72.7	0.64	-	86.4	-0.087	13.75	0.702	21.9	53.6
69			0.00	72.8	0.57	-	86.6	-0.088	13.86	0.741	22.1	53.4
70	12.066	0.173	0.00	72.8	0.63	100	87.0	-0.087	14.01	0.675	22.1	53.4
71			0.00	72.8	0.64	-	87.4	-0.087	13.86	0.671	22.0	53.4
72			0.00	72.8	0.63	-	87.7	-0.087	13.74	0.635	22.0	53.2
73			0.00	72.8	0.66	-	87.6	-0.086	13.73	0.660	21.9	53.1
74			0.00	72.8	0.66	-	87.4	-0.086	13.29	0.516	21.9	52.9
75			0.00	72.9	0.63	-	87.3	-0.085	13.15	0.450	21.5	52.5
76			0.00	72.9	0.67	-	87.3	-0.085	12.87	0.461	21.6	52.2
77			0.00	72.9	0.69	-	87.1	-0.085	12.80	0.405	21.5	52.0

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	73.0	0.66	-	87.2	-0.084	12.69	0.375	21.4	51.8
79			0.00	72.9	0.65	-	87.1	-0.083	12.62	0.341	21.5	51.4
80	13.803	0.174	0.00	72.9	0.67	100	87.1	-0.083	12.49	0.362	21.4	51.4
81			0.00	72.8	0.65	-	87.0	-0.084	12.48	0.319	21.5	51.3
82			0.00	72.8	0.72	-	86.8	-0.084	12.39	0.355	21.5	51.3
83			0.00	72.7	0.68	-	86.7	-0.084	12.46	0.345	21.4	50.9
84			0.00	72.7	0.68	-	86.6	-0.083	12.54	0.359	21.5	50.9
85			0.00	72.6	0.68	-	86.4	-0.084	12.49	0.389	21.4	50.7
86			0.00	72.5	0.67	-	86.3	-0.083	12.53	0.381	21.4	50.7
87			0.00	72.4	0.66	-	86.2	-0.083	12.67	0.373	21.4	50.7
88			0.00	72.4	0.69	-	86.0	-0.084	12.71	0.404	21.5	50.7
89			0.00	72.4	0.73	-	86.0	-0.083	12.82	0.425	21.6	50.5
90	15.550	0.175	0.00	72.4	0.73	101	85.9	-0.083	12.89	0.494	21.6	50.5
91			0.00	72.4	0.74	-	85.8	-0.084	13.04	0.497	21.5	50.7
92			0.00	72.4	0.67	-	85.7	-0.083	13.25	0.482	21.5	50.7
93			0.00	72.3	0.71	-	85.7	-0.084	13.27	0.501	21.7	50.7
94			0.00	72.3	0.74	-	85.7	-0.084	13.22	0.509	21.5	50.7
95			0.00	72.4	0.69	-	85.8	-0.084	13.14	0.536	20.9	50.9
96			0.00	72.4	0.75	-	85.7	-0.083	13.20	0.460	20.4	51.1
97			0.00	72.3	0.73	-	85.8	-0.083	12.87	0.538	20.2	51.1
98			0.00	72.3	0.69	-	85.8	-0.082	12.67	0.540	19.9	50.9
99			0.00	72.3	0.75	-	85.8	-0.083	12.67	0.511	19.7	50.9
100	17.298	0.175	0.00	72.2	0.74	101	85.7	-0.082	12.53	0.491	19.6	50.7
101			0.00	72.2	0.70	-	85.8	-0.082	11.98	0.260	19.3	50.5
102			0.00	72.2	0.74	-	85.7	-0.080	11.70	0.058	18.7	50.0
103			0.00	72.1	0.70	-	85.6	-0.079	10.73	0.021	18.3	49.1
104			0.00	72.1	0.77	-	85.7	-0.078	10.19	0.036	18.0	48.2
105			0.00	72.1	0.70	-	85.6	-0.078	9.85	0.068	17.7	47.7
106			0.00	72.1	0.72	-	85.5	-0.078	9.61	0.071	17.6	47.5
107			0.00	72.1	0.74	-	85.2	-0.077	9.47	0.080	17.4	46.9
108			0.00	72.2	0.73	-	85.3	-0.076	9.38	0.107	17.3	46.8
109			0.00	72.2	0.70	-	85.1	-0.076	9.25	0.092	17.3	46.6
110	19.041	0.174	0.00	72.1	0.77	102	84.9	-0.074	9.02	0.104	17.1	46.2
111			0.00	72.1	0.76	-	84.9	-0.072	7.85	0.201	17.0	45.9
112			0.00	72.0	0.76	-	85.0	-0.070	6.96	0.403	16.6	45.0
113			0.00	72.0	0.71	-	85.0	-0.069	5.47	1.009	16.2	44.1
114			0.00	71.9	0.76	-	85.0	-0.067	5.74	0.991	15.9	43.2
115			0.00	72.0	0.70	-	84.9	-0.067	5.65	1.058	15.9	43.2
116			0.00	71.9	0.78	-	84.8	-0.066	5.65	1.067	16.0	42.8

Data from 12/20/22 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.00	71.9	0.72	-	84.7	-0.064	5.60	1.103	16.1	42.6
118			0.00	71.9	0.80	-	84.4	-0.064	5.78	1.059	16.2	42.6
119			0.00	71.8	0.74	-	84.3	-0.063	5.84	1.064	16.4	42.6
120	20.776	0.173	0.00	71.9	0.81	100	84.1	-0.063	5.65	1.100	16.7	42.4
121			0.00	71.9	0.85	-	84.2	-0.062	5.89	1.242	16.7	42.3
122			0.00	71.9	0.82	-	84.1	-0.062	6.44	1.048	16.8	42.3
123			0.00	71.9	0.89	-	84.1	-0.061	6.21	1.125	17.0	42.4
124			0.00	71.9	0.87	-	84.1	-0.060	6.50	1.038	16.9	42.3
125			0.00	71.9	0.89	-	83.9	-0.060	6.71	1.017	17.3	41.9
126			0.00	71.9	0.95	-	83.8	-0.060	6.61	0.989	17.6	41.9
127			0.00	72.0	1.01	-	83.7	-0.060	6.40	1.117	17.7	41.7
128			0.00	72.0	1.08	-	83.7	-0.060	6.41	1.115	17.7	41.7
129			0.00	72.0	1.09	-	83.4	-0.059	6.28	1.074	17.8	41.7
130	22.518	0.174	0.00	72.0	1.12	100	83.4	-0.059	6.36	1.030	17.8	41.5
131			0.00	72.0	1.20	-	83.4	-0.058	5.95	1.136	17.7	41.4
132			0.00	72.0	1.17	-	83.4	-0.058	5.85	1.072	17.5	41.0
133			0.00	72.1	1.15	-	83.3	-0.058	5.86	1.024	17.5	40.8
134			0.00	72.0	1.15	-	83.2	-0.057	5.87	1.008	17.4	40.5
135			0.00	72.0	1.16	-	83.2	-0.056	5.82	0.977	17.4	40.5
136			0.00	72.1	1.11	-	83.3	-0.056	5.86	0.997	17.4	40.3
137			0.00	72.1	1.18	-	83.2	-0.055	5.85	0.983	17.4	40.3
138			0.00	72.1	1.16	-	83.3	-0.055	5.87	0.993	17.5	40.1
139			0.00	72.1	1.14	-	83.3	-0.055	5.75	0.961	17.6	40.1
140	24.261	0.174	0.00	72.1	1.12	100	83.2	-0.055	5.79	0.967	17.6	39.9
141			0.00	72.1	1.09	-	83.3	-0.055	5.75	0.953	17.6	40.1
142			0.00	72.0	1.14	-	83.3	-0.054	5.62	0.928	17.3	40.3
143			0.00	72.1	1.14	-	83.2	-0.053	5.68	0.940	16.9	40.5
144			0.00	72.1	1.10	-	83.1	-0.053	5.58	0.969	17.0	40.5
145			0.00	72.1	1.06	-	83.2	-0.053	5.57	0.993	17.0	40.3
146			0.00	72.0	1.08	-	83.1	-0.052	5.59	0.992	17.1	40.3
147			0.00	72.0	1.10	-	83.1	-0.052	5.61	0.982	17.3	40.3
148			0.00	72.0	1.11	-	82.9	-0.052	5.56	0.959	17.3	40.3
149			0.00	72.0	1.11	-	82.9	-0.052	5.62	0.961	17.6	40.1
150	26.025	0.176	0.00	72.0	1.09	101	82.9	-0.052	5.58	0.950	17.8	39.9
151			0.00	72.0	1.10	-	82.9	-0.052	5.62	0.952	17.8	39.9
152			0.00	72.0	1.07	-	82.9	-0.051	5.66	0.949	17.8	39.9
153			0.00	72.0	1.11	-	82.9	-0.050	5.64	0.939	17.8	39.9
154			0.00	72.0	1.09	-	82.8	-0.051	5.59	0.923	17.8	39.7
155			0.00	72.0	1.09	-	82.9	-0.050	5.56	0.916	17.8	39.7

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
156			0.00	72.0	1.03	-	82.9	-0.050	5.56	0.908	17.7	39.9
157			0.00	72.0	1.07	-	82.9	-0.050	5.60	0.916	17.7	39.7
158			0.00	72.1	1.05	-	82.7	-0.049	5.60	0.922	17.8	39.7
159			0.00	72.1	1.03	-	82.7	-0.049	5.51	0.895	17.8	39.7
160	27.787	0.176	0.00	72.1	1.08	100	82.6	-0.049	5.56	0.906	17.9	39.6
161			0.00	72.1	1.08	-	82.5	-0.049	5.28	0.947	18.3	39.6
162			0.00	72.1	1.06	-	82.4	-0.049	5.22	0.929	18.5	39.4
163			0.00	72.1	1.03	-	82.2	-0.049	5.20	0.909	18.6	39.2
164			0.00	72.1	1.02	-	82.1	-0.048	5.20	0.902	18.8	39.2
165			0.00	72.1	1.08	-	82.0	-0.048	5.18	0.891	18.9	39.2
166			0.00	72.1	1.07	-	82.1	-0.048	5.14	0.879	19.0	39.0
167			0.00	72.1	1.03	-	82.1	-0.048	5.13	0.876	19.1	39.0
168			0.00	72.1	1.09	-	82.7	-0.047	5.16	0.879	19.1	39.0
169			0.00	72.1	1.04	-	83.0	-0.047	5.13	0.870	19.1	38.8
170	29.553	0.177	0.00	72.2	1.09	99	83.4	-0.047	5.15	0.869	19.2	38.8
171			0.00	72.1	1.04	-	83.7	-0.047	5.12	0.866	19.2	38.8
172			0.00	72.0	1.02	-	83.9	-0.046	5.14	0.864	19.3	38.7
173			0.00	71.9	1.01	-	84.0	-0.047	5.16	0.863	19.4	38.7
174			0.00	72.0	1.04	-	84.2	-0.046	5.13	0.853	19.4	38.7
175			0.00	72.0	1.09	-	84.4	-0.046	5.11	0.851	19.5	38.7
176			0.00	72.0	1.05	-	84.4	-0.045	5.14	0.860	19.5	38.7
177			0.00	71.9	1.05	-	84.8	-0.046	5.08	0.843	19.7	38.7
178			0.00	71.8	1.09	-	85.0	-0.046	5.08	0.839	19.6	38.7
179			0.00	71.9	1.05	-	85.1	-0.046	5.10	0.840	19.4	38.7
180	31.321	0.177	0.00	71.9	1.05	99	85.1	-0.045	5.13	0.847	19.4	38.8
181			0.00	72.0	1.09	-	85.3	-0.046	5.09	0.834	19.4	38.8
182			0.00	72.0	1.09	-	85.5	-0.045	5.08	0.832	19.3	38.7
183			0.00	72.0	1.06	-	85.7	-0.045	5.07	0.827	19.3	38.7
184			0.00	72.1	1.08	-	85.8	-0.045	5.08	0.827	19.2	38.7
185			0.00	72.0	1.09	-	86.0	-0.045	5.07	0.824	19.3	38.7
186			0.00	72.1	1.07	-	86.0	-0.045	5.04	0.816	19.2	38.7
187			0.00	72.1	1.07	-	86.0	-0.044	5.09	0.824	19.3	38.7
188			0.00	72.1	1.08	-	86.2	-0.045	5.04	0.818	19.3	38.7
189			0.00	72.1	1.04	-	86.2	-0.044	5.08	0.818	19.3	38.7
190	33.083	0.176	0.00	72.1	1.09	99	86.4	-0.044	5.07	0.815	19.3	38.5
191			0.00	72.1	1.11	-	86.5	-0.045	5.04	0.822	19.3	38.5
192			0.00	72.1	1.05	-	86.6	-0.044	5.06	0.827	19.3	38.5
193			0.00	72.1	1.03	-	86.7	-0.044	5.04	0.821	19.3	38.5
194			0.00	72.1	1.10	-	86.7	-0.044	5.01	0.814	19.3	38.5

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
195			0.00	72.0	1.05	-	86.6	-0.044	5.03	0.813	19.4	38.5
196			0.00	72.0	1.05	-	86.7	-0.044	5.04	0.810	19.4	38.5
197			0.00	72.0	1.10	-	86.4	-0.044	5.01	0.804	19.5	38.5
198			0.00	72.0	1.03	-	86.0	-0.043	5.01	0.800	19.5	38.5
199			0.00	72.0	1.04	-	85.7	-0.043	5.02	0.802	19.5	38.5
200	34.851	0.177	0.00	72.0	1.11	100	85.4	-0.044	4.98	0.795	19.5	38.5
201			0.00	72.0	1.04	-	85.0	-0.043	4.96	0.790	19.6	38.5
202			0.00	71.9	1.12	-	84.6	-0.043	5.00	0.795	19.6	38.5
203			0.00	72.0	1.10	-	84.3	-0.043	4.88	0.779	19.6	38.5
204			0.00	72.0	1.06	-	84.0	-0.043	4.82	0.763	19.7	38.5
205			0.00	72.0	1.13	-	83.9	-0.043	4.85	0.765	19.7	38.5
206			0.00	72.0	1.08	-	83.7	-0.043	4.85	0.758	19.7	38.5
207			0.00	71.9	1.11	-	83.4	-0.043	4.82	0.747	19.7	38.5
208			0.00	72.0	1.11	-	83.2	-0.043	4.81	0.748	19.7	38.3
209			0.00	72.0	1.08	-	82.9	-0.042	4.80	0.750	19.7	38.3
210	36.631	0.178	0.00	72.0	1.11	101	82.7	-0.042	4.76	0.747	19.8	38.3
211			0.00	72.0	1.04	-	82.8	-0.043	4.78	0.745	19.7	38.3
212			0.00	72.0	1.09	-	82.9	-0.042	4.76	0.744	19.8	38.3
213			0.00	72.0	1.12	-	83.1	-0.043	4.76	0.742	19.8	38.3
214			0.00	72.0	1.08	-	83.4	-0.042	4.74	0.740	19.8	38.3
215			0.00	72.0	1.05	-	83.6	-0.042	4.75	0.742	19.8	38.3
216			0.00	72.0	1.12	-	83.8	-0.042	4.76	0.742	19.8	38.3
217			0.00	72.0	1.11	-	84.1	-0.042	4.77	0.740	19.8	38.3
218			0.00	72.0	1.13	-	84.3	-0.042	4.80	0.741	19.9	38.3
219			0.00	72.0	1.06	-	84.4	-0.042	4.78	0.739	19.9	38.1
220	38.411	0.178	0.00	72.0	1.08	101	84.6	-0.042	4.77	0.737	19.9	38.1
221			0.00	72.0	1.09	-	84.8	-0.041	4.77	0.736	19.9	38.1
222			0.00	72.0	1.06	-	84.9	-0.042	4.77	0.730	19.9	38.1
223			0.00	72.0	1.06	-	84.7	-0.041	4.73	0.728	19.9	38.1
224			0.00	72.0	1.12	-	84.7	-0.041	4.73	0.725	19.9	38.1
225			0.00	72.0	1.10	-	84.7	-0.041	4.72	0.716	20.0	38.1
226			0.00	72.0	1.11	-	84.7	-0.041	4.63	0.708	20.0	38.1
227			0.00	72.0	1.08	-	84.6	-0.041	4.62	0.702	20.0	38.1
228			0.00	72.0	1.06	-	84.5	-0.041	4.63	0.701	20.0	38.1
229			0.00	71.9	1.09	-	84.4	-0.041	4.60	0.692	20.0	38.1
230	40.187	0.178	0.00	72.0	1.15	100	84.4	-0.041	4.63	0.702	20.0	37.9
231			0.00	72.0	1.14	-	84.3	-0.041	4.60	0.695	20.1	37.9
232			0.00	71.9	1.07	-	84.3	-0.041	4.61	0.689	20.1	37.9
233			0.00	72.0	1.08	-	84.2	-0.041	4.61	0.689	20.1	37.9

Data from 12/20/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
234			0.00	71.8	1.13	-	84.2	-0.041	4.61	0.688	20.1	37.9
235			0.00	71.8	1.12	-	84.2	-0.041	4.57	0.685	20.2	37.9
236			0.00	71.8	1.11	-	84.1	-0.041	4.61	0.690	20.1	37.9
237			0.00	71.7	1.13	-	84.1	-0.041	4.56	0.683	20.2	37.9
238			0.00	71.8	1.15	-	84.1	-0.041	4.57	0.680	20.2	37.9
239			0.00	71.8	1.14	-	84.1	-0.040	4.56	0.677	20.2	37.9
240	41.960	0.177	0.00	71.8	1.16	100	83.8	-0.041	4.56	0.676	20.2	37.9
241			0.00	71.7	1.09	-	83.7	-0.040	4.55	0.667	20.3	37.9
242			0.00	71.6	1.15	-	83.5	-0.040	4.56	0.670	20.3	37.9
243			0.00	71.7	1.08	-	83.3	-0.040	4.56	0.669	20.3	37.9
244			0.00	71.7	1.10	-	83.4	-0.040	4.55	0.663	20.4	37.9
245			0.00	71.7	1.09	-	83.5	-0.040	4.57	0.665	20.4	37.9
246			0.00	71.7	1.11	-	83.4	-0.040	4.56	0.661	20.3	37.9
247			0.00	71.7	1.15	-	83.5	-0.040	4.55	0.656	20.3	37.9
248			0.00	71.8	1.16	-	83.6	-0.040	4.55	0.653	20.3	37.8
249			0.00	71.7	1.15	-	83.6	-0.040	4.53	0.645	20.3	37.8
250	43.727	0.177	0.00	71.7	1.09	99	83.7	-0.040	4.53	0.642	20.3	37.8
251			0.00	71.7	1.11	-	83.8	-0.040	4.54	0.645	20.4	37.8
252			0.00	71.7	1.13	-	83.8	-0.040	4.52	0.636	20.4	37.8
253			0.00	71.7	1.16	-	83.8	-0.040	4.53	0.632	20.4	37.8
254			0.00	71.6	1.13	-	83.8	-0.040	4.52	0.631	20.4	37.8
255			0.00	71.6	1.12	-	83.9	-0.040	4.51	0.624	20.4	37.8
256			0.00	71.6	1.16	-	83.9	-0.040	4.56	0.626	20.4	37.8
257			0.00	71.6	1.17	-	83.8	-0.040	4.55	0.624	20.4	37.8
258			0.00	71.6	1.09	-	83.8	-0.039	4.51	0.604	20.4	37.8
259			0.00	71.6	1.14	-	83.7	-0.040	4.53	0.596	20.5	37.6
260	45.503	0.178	0.00	71.7	1.18	100	83.7	-0.039	4.53	0.593	20.5	37.8
261			0.00	71.7	1.16	-	83.5	-0.039	4.51	0.584	20.5	37.6
262			0.00	71.6	1.16	-	83.5	-0.039	4.56	0.575	20.6	37.6
263			0.00	71.6	1.15	-	83.5	-0.039	4.55	0.570	20.6	37.8
264			0.00	71.6	1.18	-	83.5	-0.039	4.54	0.565	20.6	37.8
265			0.00	71.7	1.15	-	83.5	-0.039	4.54	0.558	20.6	37.6
266			0.00	71.7	1.16	-	83.6	-0.039	4.53	0.558	20.6	37.6
267			0.00	71.7	1.12	-	83.6	-0.039	4.56	0.554	20.6	37.6
268			0.00	71.7	1.11	-	83.5	-0.039	4.55	0.552	20.6	37.6
269			0.00	71.7	1.17	-	83.6	-0.039	4.58	0.547	20.6	37.6
270	47.278	0.177	0.00	71.7	1.11	100	83.5	-0.039	4.58	0.549	20.6	37.6
271			0.00	71.6	1.15	-	83.6	-0.039	4.55	0.542	20.6	37.6
272			0.00	71.6	1.12	-	83.6	-0.039	4.58	0.541	20.7	37.6

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
273			0.00	71.7	1.12	-	83.6	-0.039	4.60	0.544	20.7	37.6
274			0.00	71.6	1.19	-	83.7	-0.039	4.60	0.540	20.7	37.6
275			0.00	71.6	1.14	-	83.8	-0.039	4.61	0.542	20.7	37.6
276			0.00	71.6	1.15	-	83.7	-0.039	4.62	0.537	20.7	37.6
277			0.00	71.6	1.13	-	83.7	-0.039	4.61	0.535	20.7	37.6
278			0.00	71.6	1.18	-	83.8	-0.039	4.62	0.531	20.7	37.6
279			0.00	71.6	1.20	-	83.8	-0.039	4.57	0.519	20.7	37.6
280	49.044	0.177	0.00	71.6	1.15	100	83.8	-0.039	4.60	0.522	20.8	37.6
281			0.00	71.6	1.15	-	83.7	-0.039	4.55	0.512	20.8	37.6
282			0.00	71.6	1.22	-	83.8	-0.039	4.59	0.514	20.8	37.6
283			0.00	71.7	1.23	-	83.9	-0.038	4.57	0.508	20.8	37.6
284			0.00	71.7	1.22	-	83.8	-0.039	4.57	0.505	20.8	37.4
285			0.00	71.7	1.23	-	83.7	-0.039	4.58	0.502	20.8	37.6
286			0.00	71.7	1.17	-	83.7	-0.039	4.60	0.506	20.7	37.6
287			0.00	71.7	1.24	-	83.8	-0.039	4.58	0.496	20.7	37.6
288			0.00	71.7	1.23	-	83.8	-0.038	4.59	0.499	20.7	37.6
289			0.00	71.7	1.20	-	83.7	-0.039	4.60	0.498	20.7	37.6
290	50.821	0.178	0.00	71.7	1.18	100	83.8	-0.039	4.56	0.495	20.7	37.6
291			0.00	71.7	1.17	-	83.8	-0.038	4.55	0.495	20.7	37.6
292			0.00	71.8	1.24	-	83.8	-0.038	4.56	0.492	20.7	37.4
293			0.00	71.8	1.23	-	83.8	-0.038	4.56	0.492	20.8	37.4
294			0.00	71.8	1.24	-	83.9	-0.038	4.55	0.487	20.8	37.4
295			0.00	71.7	1.25	-	83.8	-0.038	4.58	0.483	20.8	37.4
296			0.00	71.7	1.21	-	83.9	-0.038	4.58	0.482	20.7	37.4
297			0.00	71.7	1.18	-	83.8	-0.038	4.56	0.481	20.8	37.4
298			0.00	71.7	1.19	-	83.8	-0.038	4.58	0.479	20.7	37.4
299			0.00	71.6	1.18	-	83.7	-0.038	4.56	0.478	20.8	37.4
300	52.612	0.179	0.00	71.6	1.19	101	83.6	-0.038	4.56	0.479	20.8	37.4
301			0.00	71.6	1.21	-	83.6	-0.038	4.52	0.476	20.8	37.4
302			0.00	71.6	1.21	-	83.5	-0.038	4.53	0.477	20.8	37.4
303			0.00	71.6	1.21	-	83.6	-0.038	4.57	0.484	20.9	37.4
304			0.00	71.4	1.25	-	83.5	-0.038	4.56	0.482	20.8	37.4
305			0.00	71.4	1.24	-	83.6	-0.038	4.55	0.476	20.8	37.4
306			0.00	71.3	1.21	-	83.6	-0.038	4.55	0.474	20.9	37.4
307			0.00	71.2	1.19	-	83.5	-0.038	4.54	0.472	20.9	37.2
308			0.00	71.2	1.20	-	83.5	-0.038	4.56	0.479	20.9	37.2
309			0.00	71.2	1.23	-	83.5	-0.038	4.56	0.477	20.9	37.2
310	54.388	0.178	0.00	71.2	1.26	100	83.6	-0.038	4.54	0.471	20.9	37.2
311			0.00	71.3	1.27	-	83.6	-0.038	4.53	0.468	20.9	37.2

Data from 12/20/22 testing - Reference only



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
312			0.00	71.2	1.25	-	83.3	-0.038	4.52	0.465	20.9	37.2
313			0.00	71.3	1.24	-	83.4	-0.038	4.46	0.471	20.9	37.2
314			0.00	71.3	1.21	-	83.4	-0.038	4.47	0.473	20.9	37.2
315			0.00	71.2	1.22	-	83.3	-0.038	4.45	0.468	20.9	37.2
316			0.00	71.2	1.28	-	83.4	-0.038	4.42	0.462	20.9	37.2
317			0.00	71.3	1.25	-	83.4	-0.038	4.42	0.461	20.9	37.2
318			0.00	71.3	1.28	-	83.4	-0.037	4.43	0.457	20.9	37.0
319			0.00	71.3	1.24	-	83.4	-0.038	4.43	0.455	20.9	37.0
320	56.152	0.176	0.00	71.3	1.24	99	83.4	-0.038	4.51	0.463	20.9	37.0
321			0.00	71.3	1.29	-	83.4	-0.038	4.49	0.460	20.9	37.0
322			0.00	71.2	1.27	-	83.2	-0.037	4.50	0.459	21.0	37.0
323			0.00	71.2	1.30	-	83.2	-0.037	4.48	0.456	20.9	37.0
324			0.00	71.2	1.30	-	83.1	-0.038	4.48	0.451	20.9	37.0
325			0.00	71.3	1.31	-	83.2	-0.037	4.41	0.442	20.9	37.0
326			0.00	71.3	1.28	-	83.3	-0.037	4.40	0.440	20.9	37.0
327			0.00	71.3	1.24	-	83.3	-0.037	4.37	0.437	20.9	37.0
328			0.00	71.3	1.24	-	83.3	-0.037	4.36	0.437	20.9	37.0
329			0.00	71.3	1.24	-	83.3	-0.038	4.36	0.434	20.9	36.9
330	57.929	0.178	0.00	71.3	1.25	100	83.3	-0.038	4.33	0.432	20.9	37.0
331			0.00	71.3	1.28	-	83.3	-0.036	4.34	0.432	20.9	36.9
332			0.00	71.2	1.33	-	83.2	-0.037	4.34	0.430	20.9	36.9
333			0.00	71.3	1.27	-	83.3	-0.037	4.32	0.428	21.0	36.9
334			0.00	71.3	1.32	-	83.3	-0.037	4.32	0.425	21.0	36.9
335			0.00	71.3	1.31	-	83.2	-0.037	4.25	0.430	21.0	36.9
336			0.00	71.3	1.36	-	83.2	-0.037	4.27	0.434	21.0	37.0
337			0.00	71.3	1.32	-	83.2	-0.037	4.25	0.432	21.1	36.9
338			0.00	71.3	1.36	-	83.2	-0.036	4.25	0.432	21.1	36.9
339			0.00	71.3	1.30	-	83.2	-0.037	4.23	0.429	21.1	36.9
340	59.707	0.178	0.00	71.4	1.35	100	83.2	-0.037	4.18	0.429	21.1	36.9
341			0.00	71.3	1.35	-	83.0	-0.037	3.98	0.430	21.1	36.9
342			0.00	71.3	1.31	-	82.9	-0.036	3.97	0.432	21.1	36.9
343			0.00	71.3	1.35	-	82.8	-0.037	3.92	0.428	21.1	36.9
344			0.00	71.2	1.38	-	82.9	-0.037	3.90	0.427	21.1	36.9
345			0.00	71.3	1.32	-	82.9	-0.036	3.89	0.429	21.1	36.9
346			0.00	71.2	1.34	-	82.9	-0.036	3.87	0.426	21.2	36.9
347			0.00	71.3	1.39	-	82.9	-0.036	3.87	0.424	21.2	36.9
348			0.00	71.3	1.41	-	82.9	-0.036	3.86	0.421	21.2	36.9
349			0.00	71.3	1.34	-	82.8	-0.036	3.88	0.422	21.2	36.9
350	61.485	0.178	0.00	71.3	1.34	100	82.9	-0.036	3.87	0.418	21.2	36.9

Data from 12/20/22 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
351			0.00	71.3	1.36	-	82.9	-0.036	3.87	0.417	21.2	36.9
352			0.00	71.3	1.40	-	82.9	-0.036	3.87	0.417	21.2	36.9
353			0.00	71.3	1.40	-	83.0	-0.036	3.99	0.413	21.2	36.9
354			0.00	71.3	1.36	-	82.9	-0.036	4.01	0.403	21.3	36.9
355			0.00	71.3	1.38	-	82.9	-0.036	4.02	0.395	21.3	36.9
356			0.00	71.3	1.41	-	82.9	-0.035	4.03	0.386	21.3	36.9
357			0.00	71.3	1.41	-	82.9	-0.036	4.05	0.385	21.3	36.9
358			0.00	71.3	1.38	-	82.9	-0.035	4.03	0.379	21.3	36.9
359			0.00	71.3	1.37	-	82.8	-0.036	4.09	0.387	21.3	36.9
360	63.236	0.175	0.00	71.3	1.41	99	82.8	-0.036	4.08	0.391	21.3	36.9
361			0.00	71.2	1.43	-	82.8	-0.035	4.09	0.388	21.3	36.9
362			0.00	71.2	1.46	-	82.8	-0.036	4.11	0.387	21.4	36.9
363			0.00	71.2	1.44	-	82.8	-0.035	4.11	0.385	21.4	36.9
364			0.00	71.3	1.44	-	82.8	-0.036	4.11	0.383	21.5	36.9
365			0.00	71.3	1.48	-	82.7	-0.035	4.13	0.382	21.5	36.9
366			0.00	71.4	1.51	-	82.7	-0.035	4.11	0.380	21.4	36.9
367			0.00	71.4	1.48	-	82.7	-0.035	4.09	0.377	21.5	36.9
368			0.00	71.4	1.45	-	82.6	-0.035	3.87	0.382	21.5	36.9
369			0.00	71.4	1.48	-	82.6	-0.035	3.85	0.387	21.5	36.9
370	65.011	0.177	0.00	71.4	1.52	100	82.7	-0.036	3.85	0.382	21.5	36.9
371			0.00	71.4	1.54	-	82.6	-0.035	3.83	0.378	21.5	36.9
372			0.00	71.4	1.54	-	82.6	-0.036	3.82	0.374	21.5	36.9
373			0.00	71.3	1.50	-	82.5	-0.035	3.83	0.372	21.5	36.7
374			0.00	71.4	1.48	-	82.5	-0.035	3.83	0.371	21.5	36.7
375			0.00	71.4	1.49	-	82.5	-0.035	3.81	0.368	21.5	36.9
376			0.00	71.4	1.55	-	82.5	-0.036	3.80	0.366	21.5	36.7
377			0.00	71.4	1.55	-	82.6	-0.035	3.81	0.369	21.6	36.7
378			0.00	71.5	1.55	-	82.6	-0.035	3.81	0.367	21.6	36.9
379			0.00	71.5	1.55	-	82.6	-0.035	3.78	0.364	21.6	36.9
380	66.763	0.175	0.00	71.5	1.56	99	82.6	-0.035	3.81	0.368	21.6	36.7
381			0.00	71.4	1.60	-	82.5	-0.035	3.79	0.365	21.6	36.7
382			0.00	71.4	1.62	-	82.5	-0.035	3.77	0.364	21.6	36.7
383			0.00	71.4	1.64	-	82.5	-0.035	3.78	0.363	21.6	36.7
384			0.00	71.4	1.61	-	82.5	-0.035	3.76	0.363	21.6	36.7
385			0.00	71.4	1.59	-	82.5	-0.035	3.76	0.362	21.6	36.7
386			0.00	71.4	1.66	-	82.5	-0.035	3.78	0.364	21.7	36.7
387			0.00	71.4	1.64	-	82.4	-0.035	3.76	0.360	21.7	36.7
388			0.00	71.4	1.62	-	82.5	-0.035	3.75	0.360	21.6	36.7
389			0.00	71.4	1.68	-	82.6	-0.035	3.81	0.367	21.7	36.7

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
390	68.534	0.177	0.00	71.5	1.70	99	82.6	-0.034	3.76	0.377	21.7	36.7
391			0.00	71.5	1.70	-	82.5	-0.035	3.74	0.384	21.7	36.7
392			0.00	71.6	1.69	-	82.4	-0.035	3.73	0.379	21.8	36.7
393			0.00	71.6	1.66	-	82.3	-0.035	3.70	0.374	21.8	36.7
394			0.00	71.6	1.65	-	82.4	-0.035	3.68	0.370	21.8	36.7
395			0.00	71.6	1.65	-	82.4	-0.035	3.67	0.367	21.8	36.7
396			0.00	71.7	1.66	-	82.4	-0.035	3.68	0.367	21.8	36.7
397			0.00	71.7	1.67	-	82.5	-0.035	3.66	0.366	21.8	36.7
398			0.00	71.7	1.70	-	82.5	-0.034	3.67	0.367	21.8	36.7
399			0.00	71.7	1.72	-	82.5	-0.034	3.66	0.365	21.8	36.7
400	70.286	0.175	0.00	71.7	1.74	99	82.5	-0.035	3.64	0.361	21.8	36.7
401			0.00	71.7	1.76	-	82.5	-0.034	3.62	0.358	21.8	36.7
402			0.00	71.7	1.76	-	82.5	-0.034	3.62	0.357	21.8	36.7
403			0.00	71.7	1.81	-	82.4	-0.034	3.61	0.356	21.8	36.7
404			0.00	71.7	1.82	-	82.5	-0.034	3.60	0.353	21.8	36.7
405			0.00	71.7	1.78	-	82.3	-0.034	3.63	0.355	21.8	36.7
406			0.00	71.6	1.77	-	82.3	-0.034	3.61	0.352	21.9	36.7
407			0.00	71.6	1.81	-	82.1	-0.034	3.59	0.349	21.9	36.7
408			0.00	71.7	1.78	-	82.2	-0.034	3.58	0.348	21.9	36.7
409			0.00	71.7	1.85	-	82.2	-0.034	3.58	0.348	21.9	36.7
410	72.053	0.177	0.00	71.7	1.80	100	82.1	-0.034	3.61	0.358	21.9	36.7
411			0.00	71.6	1.78	-	82.1	-0.034	3.61	0.360	21.9	36.7
412			0.00	71.5	1.81	-	82.0	-0.034	3.58	0.356	22.0	36.7
413			0.00	71.5	1.88	-	82.0	-0.034	3.57	0.356	22.0	36.7
414			0.00	71.5	1.87	-	82.7	-0.033	3.56	0.355	22.0	36.7
415			0.00	71.5	1.86	-	83.9	-0.034	3.55	0.352	22.0	36.7
416			0.00	71.5	1.90	-	84.9	-0.034	3.54	0.351	22.0	36.7
417			0.00	71.5	1.93	-	85.9	-0.034	3.51	0.350	22.0	36.7
418			0.00	71.5	1.91	-	86.8	-0.033	3.51	0.350	22.0	36.7
419			0.00	71.5	1.92	-	87.4	-0.033	3.57	0.357	22.0	36.7
420	73.826	0.177	0.00	71.5	1.94	100	88.3	-0.033	3.58	0.363	22.0	36.5
421			0.00	71.4	1.95	-	88.7	-0.033	3.12	0.354	22.0	36.5
422			0.00	71.4	1.97	-	88.3	-0.034	3.05	0.351	22.0	36.5
423			0.00	71.5	1.93	-	87.9	-0.033	3.04	0.346	22.1	36.5
424			0.00	71.4	1.95	-	87.4	-0.032	3.00	0.339	22.1	36.5
425			0.00	71.4	1.95	-	87.1	-0.033	2.99	0.339	22.1	36.5
426			0.00	71.4	1.94	-	86.6	-0.033	2.96	0.334	22.1	36.5
427			0.00	71.4	2.00	-	86.3	-0.032	2.95	0.333	22.1	36.5
428			0.00	71.4	1.93	-	86.0	-0.032	2.92	0.329	22.2	36.5

Data from 12/20/22 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
429			0.00	71.4	2.00	-	85.7	-0.032	2.92	0.330	22.2	36.5
430	75.591	0.176	0.00	71.5	1.97	99	85.4	-0.032	2.91	0.328	22.1	36.5
431			0.00	71.5	1.98	-	85.1	-0.032	2.89	0.324	22.2	36.5
432			0.00	71.4	1.95	-	85.0	-0.032	2.89	0.324	22.2	36.5
433			0.00	71.4	1.96	-	84.7	-0.032	2.88	0.324	22.2	36.5
434			0.00	71.4	2.01	-	84.5	-0.032	2.86	0.322	22.2	36.5
435			0.00	71.5	2.02	-	84.2	-0.032	2.86	0.321	22.2	36.5
436			0.00	71.4	2.01	-	84.0	-0.032	2.86	0.319	22.2	36.5
437			0.00	71.5	1.97	-	84.0	-0.031	2.85	0.320	22.3	36.5
438			0.00	71.4	2.01	-	83.8	-0.031	2.86	0.321	22.3	36.5
439			0.00	71.5	2.02	-	83.5	-0.031	2.84	0.319	22.3	36.5
440	77.346	0.176	0.00	71.5	2.00	98	83.4	-0.031	2.84	0.318	22.3	36.5
441			0.00	71.4	2.07	-	83.2	-0.032	2.85	0.318	22.3	36.5
442			0.00	71.3	2.10	-	83.0	-0.031	2.84	0.316	22.3	36.5
443			0.00	71.2	2.06	-	83.0	-0.031	2.86	0.318	22.4	36.5
444			0.00	71.1	2.12	-	82.9	-0.031	2.90	0.321	22.4	36.5
445			0.00	71.2	2.12	-	82.9	-0.031	2.89	0.321	22.4	36.5
446			0.00	71.2	2.04	-	82.7	-0.031	2.89	0.320	22.4	36.5
447			0.00	71.2	2.06	-	82.5	-0.030	2.88	0.318	22.4	36.5
448			0.00	71.2	2.10	-	82.4	-0.030	2.91	0.324	22.5	36.5
449			0.00	71.3	2.09	-	82.4	-0.031	2.90	0.321	22.5	36.5
450	79.127	0.178	0.00	70.9	2.09	99	82.4	-0.030	2.90	0.321	22.5	36.3
Avg/Tot	79.127	0.176	0.00	71.8	1.12	100	84.0	-0.052	6.45	0.541	20.27	41.951

Data from 12/20/22 testing - Reference Only

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	72.3	0.23		86.6
1			0.00	72.3	0.23	-	86.8
2			0.00	72.4	0.25	-	87.4
3			0.00	72.5	0.23	-	87.2
4			0.00	72.5	0.23	-	84.6
5			0.00	72.6	0.23	-	84.3
6			0.00	72.7	0.23	-	84.5
7			0.00	72.7	0.23	-	84.6
8			0.00	72.8	0.22	-	84.5
9			0.00	72.8	0.22	-	84.3
10	1.726	0.173	0.00	72.8	0.22	106	84.2
11			0.00	72.9	0.21	-	84.1
12			0.00	72.9	0.22	-	84.1
13			0.00	73.0	0.20	-	84.3
14			0.00	73.0	0.23	-	84.1
15			0.00	73.0	0.23	-	83.8
16			0.00	73.0	0.22	-	83.5
17			0.00	73.0	0.22	-	82.9
18			0.00	73.0	0.22	-	82.6
19			0.00	73.1	0.22	-	82.1
20	3.419	0.169	0.00	73.1	0.21	102	82.0
21			0.00	73.1	0.21	-	81.7
22			0.00	73.1	0.22	-	82.2
23			0.00	73.1	0.20	-	82.9
24			0.00	73.1	0.21	-	83.4
25			0.00	73.2	0.22	-	83.9
26			0.00	73.2	0.22	-	84.2
27			0.00	73.2	0.21	-	84.5
28			0.00	73.2	0.20	-	85.1
29			0.00	73.2	0.20	-	85.4
30	5.118	0.170	0.00	73.2	0.21	102	85.7
31			0.00	73.1	0.23	-	85.9

Data from 12/20/22 testing - Reference only

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	73.1	0.21	-	86.1
33			0.00	73.0	0.21	-	86.2
34			0.00	73.0	0.21	-	86.0
35			0.00	73.0	0.21	-	85.8
36			0.00	73.0	0.20	-	85.5
37			0.00	73.0	0.20	-	85.3
38			0.00	73.1	0.20	-	85.2
39			0.00	73.1	0.21	-	85.1
40	6.821	0.170	0.00	73.1	0.21	101	85.0
41			0.00	73.1	0.22	-	85.0
42			0.00	73.1	0.22	-	85.0
43			0.00	73.1	0.23	-	84.9
44			0.00	73.1	0.23	-	84.9
45			0.00	73.0	0.22	-	84.9
46			0.00	73.1	0.24	-	84.8
47			0.00	73.1	0.23	-	84.7
48			0.00	73.1	0.23	-	84.6
49			0.00	73.0	0.23	-	84.6
50	8.551	0.173	0.00	73.1	0.23	103	84.4
51			0.00	73.0	0.24	-	84.4
52			0.00	72.9	0.24	-	84.3
53			0.00	72.9	0.23	-	84.2
54			0.00	72.9	0.25	-	84.3
55			0.00	72.9	0.25	-	84.5
56			0.00	73.0	0.25	-	84.7
57			0.00	73.1	0.26	-	85.0
58			0.00	73.1	0.28	-	84.9
59			0.00	73.1	0.28	-	84.9
60	10.284	0.173	0.00	73.1	0.28	104	85.2
Avg/Tot	10.284	0.171	0.00	73.0	0.22	103	84.6

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	610.1	459.3	546.5	426.0	436.7	495.7	0
1	573.0	462.6	544.1	425.4	438.2	488.7	0
2	546.9	465.6	539.4	423.4	436.3	482.3	0
3	550.6	467.1	532.6	421.2	434.0	481.1	0
4	572.8	466.4	522.8	419.0	431.8	482.6	0
5	597.7	465.6	511.7	417.5	430.8	484.7	0
6	621.5	464.5	501.2	415.8	428.8	486.4	0
7	639.2	462.5	491.5	413.3	425.8	486.5	0
8	649.9	460.0	482.4	411.7	423.3	485.5	0
9	658.2	457.6	474.1	410.0	420.1	484.0	0
10	665.4	455.2	466.8	408.0	417.4	482.6	0
11	670.5	452.2	460.2	405.6	415.0	480.7	0
12	673.9	449.0	454.4	403.9	412.5	478.7	0
13	673.9	446.2	449.7	401.8	409.5	476.2	0
14	679.2	442.7	444.6	400.3	406.4	474.6	0
15	683.9	435.3	439.9	398.2	403.5	472.1	0
16	690.2	428.0	436.0	397.0	400.4	470.3	0
17	688.9	421.4	432.4	394.7	397.8	467.0	0
18	683.6	414.9	428.8	393.5	395.3	463.2	0
19	677.4	410.2	425.3	391.8	393.0	459.5	0
20	675.1	405.9	421.7	389.6	389.5	456.4	0
21	674.3	401.6	418.0	387.6	386.0	453.5	0
22	674.1	397.4	414.4	385.6	382.7	450.9	0
23	674.3	393.1	410.9	383.8	379.4	448.3	0
24	674.0	388.9	407.7	381.3	376.0	445.6	0
25	674.3	384.9	404.7	379.2	372.7	443.2	0
26	675.2	380.8	401.6	377.0	369.6	440.8	0
27	675.7	376.9	398.6	375.0	366.7	438.6	0
28	676.8	372.9	395.6	373.4	363.7	436.5	0
29	678.2	369.0	392.8	371.7	360.9	434.5	0
30	680.3	365.2	390.1	370.1	358.3	432.8	0
31	682.8	361.4	387.6	368.6	355.9	431.2	0
32	685.0	357.7	385.1	367.5	353.3	429.7	0
33	686.7	354.2	382.8	366.2	351.0	428.2	0
34	688.4	351.0	380.7	365.1	349.0	426.8	0
35	690.3	347.9	378.8	363.9	347.0	425.6	0
36	692.3	344.8	376.9	362.8	345.1	424.4	0
37	694.2	341.8	375.2	362.1	343.2	423.3	0
38	697.3	339.0	373.7	361.1	341.4	422.5	0
39	701.2	336.1	372.4	360.9	339.6	422.1	0
40	705.3	333.3	371.4	360.3	338.1	421.7	0
41	708.9	330.4	370.4	360.1	336.6	421.3	0
42	711.7	327.7	369.5	359.8	335.4	420.8	0
43	713.9	325.2	368.8	359.6	334.3	420.4	0
44	716.0	322.6	368.3	359.6	333.3	420.0	0
45	718.4	320.2	367.7	359.4	332.4	419.6	0
46	720.8	317.7	367.2	359.6	331.6	419.4	0
47	722.9	315.3	366.8	359.4	330.8	419.1	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	725.4	313.1	366.6	359.0	330.2	418.8	0
49	727.9	310.9	366.4	358.7	329.5	418.7	0
50	729.8	308.7	366.2	358.4	329.0	418.5	0
51	731.7	306.6	366.2	358.3	328.6	418.3	0
52	732.5	304.6	366.1	357.9	328.2	417.9	0
53	734.1	302.8	366.1	358.0	327.8	417.8	0
54	735.8	301.1	366.2	357.7	327.4	417.6	0
55	736.8	299.4	366.4	357.9	327.1	417.5	0
56	737.7	297.6	366.7	357.8	327.0	417.4	0
57	738.5	295.9	367.0	357.9	326.9	417.2	0
58	738.7	294.3	367.3	358.0	326.8	417.0	0
59	739.5	292.7	367.7	358.1	326.8	417.0	0
60	739.7	291.4	368.1	358.2	326.9	416.8	0
61	740.5	289.9	368.5	358.1	327.1	416.8	0
62	741.7	288.3	369.0	358.3	327.1	416.9	0
63	743.5	286.9	369.5	358.1	327.1	417.0	0
64	745.7	285.4	369.9	358.1	327.1	417.2	0
65	746.8	284.2	370.2	358.6	327.1	417.4	0
66	748.8	282.9	370.6	358.5	327.2	417.6	0
67	751.7	281.9	370.9	358.8	327.2	418.1	0
68	754.0	280.9	371.4	359.1	327.1	418.5	0
69	756.1	279.7	372.0	359.4	327.2	418.9	0
70	758.3	278.7	372.9	359.8	327.2	419.4	0
71	760.3	277.7	373.7	359.4	327.3	419.7	0
72	762.0	276.7	374.7	360.0	327.2	420.1	0
73	763.0	275.8	375.7	360.4	327.4	420.5	0
74	762.6	274.9	376.8	360.9	327.5	420.5	0
75	761.1	274.3	377.7	361.4	327.7	420.4	0
76	758.2	273.7	378.7	361.9	327.9	420.1	0
77	753.9	273.2	379.8	362.2	328.1	419.4	0
78	749.9	272.7	380.8	362.9	328.3	418.9	0
79	746.0	272.2	381.8	363.6	328.5	418.4	0
80	743.1	271.7	382.8	364.3	328.8	418.2	0
81	740.9	271.2	384.0	365.0	329.2	418.1	0
82	738.4	270.6	385.0	365.9	329.5	417.9	0
83	736.4	270.1	386.2	366.5	329.8	417.8	0
84	735.0	269.6	387.4	367.3	330.1	417.9	0
85	734.1	269.0	388.5	368.1	330.5	418.0	0
86	732.8	268.3	389.6	368.7	330.9	418.0	0
87	732.3	267.4	390.7	369.2	331.3	418.2	0
88	731.5	266.7	391.9	370.1	331.8	418.4	0
89	731.8	266.1	393.0	370.9	332.3	418.9	0
90	732.9	265.7	394.2	370.9	332.9	419.3	0
91	734.1	265.2	395.4	371.4	333.5	419.9	0
92	736.1	264.8	396.6	371.9	333.9	420.6	0
93	739.2	264.4	397.7	372.8	334.6	421.8	0
94	741.6	263.8	398.9	373.7	335.6	422.7	0
95	743.4	263.4	400.1	374.4	336.5	423.5	0

Data from 12/20/22 testing - Reference only



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
96	744.5	263.1	401.3	375.1	337.3	424.3	0
97	745.0	262.9	402.4	375.7	338.1	424.8	0
98	744.3	262.7	403.5	376.4	338.9	425.2	0
99	743.4	262.6	404.7	376.9	339.7	425.4	0
100	743.2	262.5	405.8	377.4	340.5	425.9	0
101	741.4	262.4	406.9	377.8	341.3	426.0	0
102	736.2	262.5	407.9	378.0	341.8	425.3	0
103	728.5	262.7	408.7	378.2	342.5	424.1	0
104	719.8	262.8	409.3	378.4	343.5	422.8	0
105	710.9	263.0	409.7	378.5	344.3	421.3	0
106	701.8	263.2	409.8	378.3	345.1	419.7	0
107	693.4	263.3	409.7	378.0	345.8	418.1	0
108	686.4	263.6	409.4	377.7	346.5	416.7	0
109	680.3	263.6	409.0	377.1	347.0	415.4	0
110	674.2	263.7	408.3	376.5	347.5	414.0	0
111	665.7	263.8	407.3	375.5	348.0	412.1	0
112	654.1	263.9	406.1	374.7	348.4	409.4	0
113	638.2	264.0	404.5	373.7	348.6	405.8	0
114	621.2	264.1	402.5	372.5	348.7	401.8	0
115	604.7	264.3	400.2	371.2	349.0	397.9	0
116	589.0	264.2	397.4	369.9	348.9	393.9	0
117	574.4	264.3	394.5	368.1	348.4	390.0	0
118	561.6	264.5	391.7	367.1	348.1	386.6	0
119	549.8	264.8	388.9	365.8	347.9	383.4	0
120	538.3	265.0	386.2	364.3	347.6	380.3	0
121	527.8	265.3	383.6	362.6	347.2	377.3	0
122	518.8	265.5	381.2	361.0	346.7	374.6	0
123	510.5	265.7	379.0	359.4	346.1	372.1	0
124	503.7	265.9	376.9	357.8	345.7	370.0	0
125	497.8	266.2	375.3	356.5	345.4	368.2	0
126	492.3	266.5	373.8	355.0	344.9	366.5	0
127	487.3	266.8	372.6	353.5	344.3	364.9	0
128	482.9	267.1	371.7	352.0	343.8	363.5	0
129	478.6	267.4	370.8	350.4	343.2	362.1	0
130	473.9	267.7	370.0	348.9	342.6	360.6	0
131	468.9	267.8	369.3	347.2	341.9	359.0	0
132	464.1	268.1	368.6	345.6	341.2	357.5	0
133	459.1	268.2	367.9	344.2	340.4	356.0	0
134	454.5	268.2	367.2	342.8	339.6	354.5	0
135	449.8	268.3	366.5	341.3	338.8	353.0	0
136	445.8	268.6	365.8	339.9	338.0	351.6	0
137	441.9	268.5	365.2	338.6	337.2	350.3	0
138	437.9	268.6	364.5	337.2	336.4	348.9	0
139	434.1	268.7	363.9	335.8	335.5	347.6	0
140	430.4	268.8	363.2	334.6	334.7	346.3	0
141	426.6	269.0	362.5	332.7	333.3	344.8	0
142	422.8	268.7	361.6	330.3	331.6	343.0	0
143	419.4	268.2	360.5	328.4	329.9	341.3	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
144	415.8	267.7	359.3	326.6	328.4	339.5	0
145	412.3	267.1	358.0	324.8	326.9	337.8	0
146	408.7	266.6	356.6	323.1	325.6	336.1	0
147	405.3	266.1	355.2	321.6	324.2	334.5	0
148	402.2	265.8	353.7	320.5	323.3	333.1	0
149	399.4	265.6	352.4	319.2	322.4	331.8	0
150	396.8	265.4	351.2	318.0	321.7	330.6	0
151	394.3	265.3	350.1	316.9	320.9	329.5	0
152	392.0	265.2	349.1	315.6	320.1	328.4	0
153	389.8	265.1	348.1	314.7	319.4	327.4	0
154	387.8	265.0	347.1	313.8	318.5	326.4	0
155	385.5	264.8	346.1	312.7	317.4	325.3	0
156	383.1	264.5	345.1	311.7	316.4	324.2	0
157	381.1	264.1	344.1	310.8	315.5	323.1	0
158	379.1	263.8	343.2	310.0	314.6	322.1	0
159	377.1	263.5	342.3	309.0	313.8	321.1	0
160	375.4	263.4	341.4	308.1	313.0	320.2	0
161	373.5	263.1	340.5	307.2	312.0	319.3	0
162	371.5	262.9	339.7	306.4	311.1	318.3	0
163	369.5	262.7	338.9	305.6	310.2	317.4	0
164	367.5	262.4	338.2	304.7	309.6	316.5	0
165	365.5	262.0	337.4	303.9	308.9	315.5	0
166	363.7	261.9	336.7	303.2	308.1	314.7	0
167	361.8	261.7	336.0	302.6	307.3	313.9	0
168	360.0	261.6	335.3	301.9	306.6	313.1	0
169	358.2	261.4	334.6	301.1	305.9	312.3	0
170	356.5	261.1	334.0	300.5	305.3	311.5	0
171	354.7	260.9	333.3	299.9	304.6	310.7	0
172	353.0	260.6	332.8	299.2	304.1	309.9	0
173	351.5	260.2	332.3	298.4	303.6	309.2	0
174	349.9	260.0	331.7	297.7	303.0	308.5	0
175	348.6	259.9	331.2	297.1	302.5	307.8	0
176	347.3	259.7	330.7	296.7	302.4	307.4	0
177	346.3	259.6	330.2	296.3	302.3	307.0	0
178	345.4	259.5	329.7	295.9	302.0	306.5	0
179	344.3	259.5	329.2	295.5	301.8	306.1	0
180	343.1	259.5	328.8	295.1	301.6	305.6	0
181	342.1	259.5	328.2	294.7	301.3	305.2	0
182	341.1	259.4	327.7	294.2	300.9	304.7	0
183	340.1	259.4	327.3	293.7	300.6	304.2	0
184	339.1	259.3	326.8	293.3	300.2	303.8	0
185	338.3	259.2	326.4	292.8	299.8	303.3	0
186	337.4	259.2	325.9	292.4	299.4	302.9	0
187	336.7	259.1	325.5	291.8	299.0	302.4	0
188	335.7	259.1	325.1	291.4	298.7	302.0	0
189	334.8	259.0	324.7	291.0	298.3	301.6	0
190	334.0	259.1	324.3	290.5	297.8	301.1	0
191	333.1	259.0	323.9	290.0	297.4	300.7	0

Data from 12/20/22 test - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
192	332.4	259.0	323.6	289.6	297.1	300.3	0
193	331.8	258.9	323.3	289.1	296.7	300.0	0
194	331.0	259.0	322.9	288.7	296.3	299.6	0
195	330.4	259.0	322.7	288.2	296.0	299.2	0
196	329.7	258.9	322.3	287.8	295.6	298.9	0
197	329.1	258.9	321.9	287.5	295.3	298.5	0
198	328.5	258.8	321.6	286.9	295.0	298.1	0
199	327.7	258.7	321.3	286.6	294.6	297.8	0
200	327.1	258.6	321.0	286.1	294.2	297.4	0
201	326.5	258.6	320.8	285.8	293.9	297.1	0
202	325.9	258.6	320.4	285.4	293.5	296.8	0
203	325.3	258.5	320.2	285.0	293.2	296.4	0
204	324.8	258.6	319.9	284.6	292.9	296.2	0
205	324.2	258.5	319.6	284.2	292.5	295.8	0
206	323.7	258.5	319.2	283.8	292.2	295.5	0
207	322.9	258.3	318.8	283.4	291.8	295.1	0
208	322.4	258.3	318.4	283.0	291.5	294.7	0
209	321.8	258.2	318.1	282.7	291.2	294.4	0
210	321.2	258.2	317.6	282.3	290.9	294.0	0
211	320.6	258.1	317.2	281.8	290.4	293.6	0
212	319.9	258.0	316.9	281.6	290.0	293.3	0
213	319.3	258.0	316.5	281.1	289.7	292.9	0
214	318.6	257.9	316.1	280.8	289.4	292.6	0
215	318.0	257.7	315.7	280.5	288.9	292.2	0
216	317.3	257.7	315.4	280.1	288.6	291.8	0
217	316.7	257.7	315.1	279.7	288.2	291.5	0
218	316.1	257.5	314.8	279.3	287.8	291.1	0
219	315.5	257.4	314.5	278.9	287.4	290.8	0
220	314.8	257.3	314.2	278.6	287.1	290.4	0
221	314.2	257.2	314.0	278.3	286.7	290.1	0
222	313.7	257.1	313.8	278.0	286.3	289.8	0
223	313.0	257.0	313.6	277.5	286.0	289.4	0
224	312.4	256.9	313.5	277.3	285.5	289.1	0
225	311.7	256.9	313.3	276.9	285.2	288.8	0
226	311.1	256.8	313.2	276.5	284.9	288.5	0
227	310.7	256.7	313.0	276.2	284.7	288.3	0
228	310.1	256.6	312.6	275.9	284.3	287.9	0
229	309.8	256.5	311.9	275.5	284.0	287.6	0
230	309.3	256.5	311.3	275.2	283.7	287.2	0
231	308.9	256.4	310.5	274.9	283.3	286.8	0
232	308.5	256.3	309.8	274.6	283.1	286.5	0
233	308.1	256.2	309.0	274.2	282.8	286.1	0
234	307.6	256.1	308.3	273.9	282.5	285.7	0
235	307.1	256.0	307.5	273.5	282.2	285.3	0
236	306.6	255.9	306.8	273.2	281.9	284.9	0
237	306.2	255.9	306.2	272.8	281.6	284.5	0
238	305.8	255.7	305.6	272.5	281.4	284.2	0
239	305.4	255.7	305.0	272.2	281.1	283.9	0

Data from 12/20/22 test - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
240	304.9	255.6	304.4	271.9	280.9	283.5	0
241	304.5	255.6	303.9	271.6	280.6	283.2	0
242	304.1	255.5	303.4	271.2	280.2	282.9	0
243	303.7	255.6	303.0	270.8	280.0	282.6	0
244	303.3	255.4	302.5	270.5	279.7	282.3	0
245	302.7	255.4	302.2	270.2	279.4	282.0	0
246	302.3	255.3	301.8	269.9	279.1	281.7	0
247	302.0	255.2	301.5	269.5	278.9	281.4	0
248	301.5	255.2	301.1	269.0	278.5	281.1	0
249	301.1	255.1	300.8	268.7	278.2	280.8	0
250	300.8	255.1	300.5	268.4	278.0	280.6	0
251	300.3	255.0	300.2	268.1	277.6	280.3	0
252	300.0	254.9	300.0	267.9	277.3	280.0	0
253	299.6	254.8	299.7	267.6	277.1	279.7	0
254	299.3	254.7	299.4	267.4	276.8	279.5	0
255	298.9	254.7	299.2	267.1	276.6	279.3	0
256	298.4	254.5	299.0	266.9	276.2	279.0	0
257	297.9	254.5	298.8	266.6	276.0	278.7	0
258	297.6	254.4	298.7	266.3	275.7	278.5	0
259	297.3	254.4	298.6	266.1	275.5	278.4	0
260	296.8	254.3	298.5	265.9	275.2	278.1	0
261	296.5	254.2	298.3	265.6	274.9	277.9	0
262	296.3	254.1	298.3	265.5	274.7	277.8	0
263	296.0	254.1	298.2	265.2	274.4	277.6	0
264	295.8	254.0	298.1	265.0	274.2	277.4	0
265	295.4	254.0	298.1	264.8	273.9	277.2	0
266	295.1	254.0	298.0	264.6	273.7	277.1	0
267	294.7	253.8	298.0	264.3	273.4	276.9	0
268	294.4	253.8	298.1	264.1	273.1	276.7	0
269	294.2	253.7	298.1	263.9	272.9	276.5	0
270	294.0	253.7	298.2	263.7	272.6	276.4	0
271	293.8	253.6	298.3	263.4	272.5	276.3	0
272	293.5	253.5	298.4	263.2	272.3	276.2	0
273	293.3	253.5	298.6	263.0	272.1	276.1	0
274	293.1	253.4	298.7	262.7	272.0	276.0	0
275	292.8	253.4	298.8	262.7	271.8	275.9	0
276	292.7	253.4	299.0	262.5	271.6	275.8	0
277	292.5	253.4	299.2	262.3	271.4	275.7	0
278	292.3	253.4	299.4	262.1	271.2	275.7	0
279	292.0	253.4	299.6	261.9	271.1	275.6	0
280	291.7	253.4	299.8	261.7	270.9	275.5	0
281	291.4	253.4	299.9	261.6	270.8	275.4	0
282	291.2	253.4	300.1	261.4	270.7	275.3	0
283	291.1	253.5	300.1	261.2	270.6	275.3	0
284	290.8	253.5	300.2	261.0	270.4	275.2	0
285	290.6	253.5	300.3	260.8	270.0	275.1	0
286	290.4	253.5	300.3	260.6	270.0	274.9	0
287	290.3	253.5	300.4	260.4	269.7	274.9	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
288	290.1	253.4	300.4	260.2	269.6	274.7	0
289	289.8	253.4	300.5	260.0	269.5	274.6	0
290	289.6	253.4	300.5	259.9	269.4	274.6	0
291	289.3	253.4	300.5	259.7	269.2	274.4	0
292	289.3	253.6	300.5	259.5	269.1	274.4	0
293	289.1	253.6	300.6	259.3	268.9	274.3	0
294	288.9	253.6	300.6	259.2	268.8	274.2	0
295	288.8	253.7	300.6	259.0	268.6	274.1	0
296	288.7	253.7	300.6	258.9	268.6	274.1	0
297	288.6	253.7	300.6	258.9	268.5	274.1	0
298	288.6	253.8	300.5	258.7	268.4	274.0	0
299	288.5	253.9	300.5	258.5	268.3	273.9	0
300	288.4	253.9	300.5	258.3	268.3	273.9	0
301	288.2	253.9	300.4	258.1	268.2	273.8	0
302	288.0	253.9	300.5	258.0	268.2	273.7	0
303	287.8	253.9	300.5	257.8	268.2	273.6	0
304	287.7	253.9	300.5	257.7	268.0	273.6	0
305	287.5	253.9	300.5	257.5	267.9	273.5	0
306	287.5	253.9	300.5	257.4	268.0	273.5	0
307	287.6	253.8	300.5	257.3	267.8	273.4	0
308	287.4	253.9	300.5	257.2	267.8	273.4	0
309	287.5	253.9	300.5	257.0	267.7	273.3	0
310	287.6	253.9	300.5	256.9	267.7	273.3	0
311	287.6	253.9	300.5	256.9	267.6	273.3	0
312	287.5	253.8	300.6	256.8	267.5	273.3	0
313	287.5	253.9	300.6	256.7	267.4	273.2	0
314	287.6	253.9	300.6	256.6	267.4	273.2	0
315	287.5	253.8	300.5	256.5	267.3	273.1	0
316	287.3	253.8	300.4	256.3	267.2	273.0	0
317	287.2	253.8	300.3	256.1	267.0	272.9	0
318	287.1	253.7	300.3	256.0	266.8	272.8	0
319	286.9	253.7	300.2	255.9	266.6	272.7	0
320	286.8	253.6	300.1	255.9	266.4	272.6	0
321	286.5	253.5	300.1	255.7	266.2	272.4	0
322	286.5	253.4	300.1	255.6	266.0	272.3	0
323	286.5	253.3	300.2	255.4	265.6	272.2	0
324	286.3	253.1	300.3	255.3	265.3	272.1	0
325	286.1	253.0	300.3	255.2	265.0	271.9	0
326	285.9	252.9	300.5	255.0	264.7	271.8	0
327	285.5	252.7	300.6	254.9	264.4	271.6	0
328	285.3	252.6	300.8	254.8	264.1	271.5	0
329	284.9	252.5	300.9	254.8	263.7	271.4	0
330	284.7	252.4	301.1	254.6	263.3	271.2	0
331	284.4	252.2	301.2	254.4	262.9	271.0	0
332	284.1	252.1	301.3	254.4	262.6	270.9	0
333	283.9	252.0	301.4	254.2	262.3	270.8	0
334	283.6	251.9	301.5	254.1	261.9	270.6	0
335	283.3	251.7	301.7	253.9	261.5	270.4	0

Data from 12/20/22 testings - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
336	283.0	251.5	301.7	253.9	261.1	270.2	0
337	282.8	251.3	301.7	253.7	260.7	270.1	0
338	282.4	251.1	301.7	253.5	260.4	269.8	0
339	282.1	251.0	301.6	253.4	260.1	269.6	0
340	281.8	250.9	301.5	253.3	259.7	269.4	0
341	281.6	250.8	301.4	253.2	259.3	269.3	0
342	281.3	250.7	301.2	253.1	259.0	269.0	0
343	280.9	250.5	301.0	252.9	258.6	268.8	0
344	280.6	250.4	300.7	252.8	258.3	268.6	0
345	280.2	250.2	300.4	252.6	258.0	268.3	0
346	279.8	250.1	300.0	252.4	257.5	268.0	0
347	279.3	250.0	299.7	252.1	257.2	267.7	0
348	278.9	249.8	299.2	251.9	256.7	267.3	0
349	278.2	249.7	298.9	251.7	256.4	267.0	0
350	277.7	249.5	298.5	251.2	256.1	266.6	0
351	277.3	249.2	298.1	250.7	255.7	266.2	0
352	276.8	249.0	297.7	250.3	255.3	265.8	0
353	276.4	248.8	297.4	249.8	254.9	265.5	0
354	275.9	248.5	297.1	249.4	254.5	265.1	0
355	275.5	248.4	296.7	248.8	254.1	264.7	0
356	275.1	248.1	296.5	248.4	253.7	264.4	0
357	274.7	247.9	296.3	247.9	253.2	264.0	0
358	274.4	247.7	296.2	247.4	252.8	263.7	0
359	274.2	247.4	296.0	246.8	252.4	263.4	0
360	273.9	247.3	296.0	246.3	252.0	263.1	0
361	273.6	247.1	295.9	245.9	251.6	262.8	0
362	273.3	246.9	296.0	245.3	251.3	262.6	0
363	273.2	246.7	296.1	244.8	251.0	262.4	0
364	272.9	246.5	296.2	244.3	250.6	262.1	0
365	272.8	246.4	296.4	243.8	250.3	261.9	0
366	272.7	246.2	296.6	243.3	250.0	261.8	0
367	272.5	246.0	296.8	242.8	249.8	261.6	0
368	272.3	245.8	297.1	242.5	249.5	261.4	0
369	271.9	245.7	297.3	242.0	249.3	261.2	0
370	271.6	245.5	297.3	241.5	249.0	261.0	0
371	271.3	245.3	297.0	241.1	248.8	260.7	0
372	271.0	245.2	296.5	240.7	248.5	260.4	0
373	270.7	245.0	295.9	240.3	248.3	260.0	0
374	270.4	244.9	295.2	240.0	248.0	259.7	0
375	270.0	244.8	294.5	239.5	247.7	259.3	0
376	269.6	244.7	293.9	239.1	247.4	258.9	0
377	269.3	244.4	293.2	238.7	247.0	258.5	0
378	268.9	244.3	292.6	238.3	246.7	258.2	0
379	268.7	244.1	292.1	237.9	246.4	257.8	0
380	268.4	244.0	291.6	237.5	246.0	257.5	0
381	268.1	243.9	291.1	237.2	245.6	257.2	0
382	267.8	243.7	290.6	236.8	245.3	256.8	0
383	267.6	243.5	290.1	236.4	244.9	256.5	0

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
384	267.3	243.3	289.7	236.0	244.5	256.2	0
385	267.0	243.1	289.3	235.7	244.0	255.8	0
386	266.7	243.0	289.0	235.4	243.7	255.6	0
387	266.4	242.8	288.7	235.1	243.2	255.3	0
388	266.0	242.6	288.4	234.7	242.9	254.9	0
389	265.8	242.5	288.1	234.2	242.4	254.6	0
390	265.6	242.3	287.8	233.9	242.1	254.3	0
391	265.3	242.1	287.5	233.5	241.6	254.0	0
392	265.1	242.0	287.1	233.3	241.2	253.8	0
393	264.9	241.9	286.7	232.9	240.8	253.4	0
394	264.5	241.8	286.2	232.6	240.4	253.1	0
395	264.4	241.6	285.9	232.3	239.9	252.8	0
396	264.1	241.4	285.5	232.0	239.5	252.5	0
397	263.7	241.3	285.0	231.6	239.1	252.1	0
398	263.4	241.1	284.7	231.3	238.7	251.9	0
399	263.1	241.0	284.3	231.0	238.4	251.6	0
400	262.8	240.8	284.0	230.7	238.0	251.3	0
401	262.4	240.7	283.7	230.4	237.7	251.0	0
402	262.1	240.5	283.4	230.1	237.3	250.7	0
403	262.0	240.3	283.2	229.7	237.0	250.4	0
404	261.4	240.2	283.0	229.4	236.6	250.1	0
405	261.1	239.9	282.9	229.0	236.2	249.8	0
406	260.8	239.8	282.8	228.7	235.9	249.6	0
407	260.4	239.6	282.6	228.4	235.5	249.3	0
408	260.1	239.4	282.5	228.1	235.1	249.0	0
409	259.8	239.2	282.4	227.7	234.7	248.8	0
410	259.5	239.0	282.3	227.3	234.5	248.5	0
411	259.1	238.9	282.2	227.0	234.1	248.3	0
412	258.8	238.7	282.1	226.6	233.7	248.0	0
413	258.4	238.6	282.0	226.3	233.4	247.7	0
414	258.1	238.4	281.8	226.0	233.0	247.5	0
415	257.8	238.2	281.8	225.7	232.7	247.2	0
416	257.5	238.1	281.7	225.4	232.4	247.0	0
417	257.2	237.9	281.6	225.1	232.0	246.8	0
418	256.7	237.8	281.5	224.8	231.6	246.5	0
419	256.6	237.7	281.4	224.5	231.3	246.3	0
420	256.2	237.6	281.5	224.1	230.9	246.0	0
421	255.7	237.3	281.4	223.7	230.7	245.8	0
422	255.2	237.2	281.0	223.5	230.4	245.4	0
423	254.7	237.1	280.3	223.2	230.0	245.1	0
424	254.1	236.9	279.5	222.8	229.8	244.6	0
425	253.7	236.7	278.6	222.5	229.4	244.2	0
426	253.0	236.6	277.8	222.0	229.1	243.7	0
427	252.4	236.3	276.9	221.6	228.7	243.2	0
428	251.9	236.1	275.9	221.2	228.2	242.7	0
429	251.2	235.9	275.0	220.8	227.8	242.1	0
430	250.5	235.7	274.1	220.3	227.4	241.6	0
431	249.9	235.4	273.2	219.8	227.0	241.1	0

Data from 12/20/22 test - Reference only

## WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
432	249.2	235.2	272.3	219.3	226.5	240.5	0
433	248.5	234.9	271.4	218.8	226.1	240.0	0
434	247.9	234.6	270.5	218.4	225.6	239.4	0
435	247.3	234.3	269.7	217.9	225.1	238.9	0
436	246.5	233.9	268.9	217.3	224.6	238.2	0
437	245.9	233.6	268.1	216.7	224.1	237.7	0
438	245.3	233.3	267.4	216.2	223.6	237.2	0
439	244.6	233.0	266.7	215.7	223.2	236.6	0
440	244.1	232.6	265.9	215.1	222.7	236.1	0
441	243.4	232.2	265.2	214.5	222.1	235.5	0
442	242.8	231.8	264.6	214.0	221.6	235.0	0
443	242.2	231.4	264.0	213.4	221.2	234.4	0
444	241.5	231.0	263.3	212.9	220.6	233.9	0
445	240.9	230.6	262.7	212.3	220.2	233.3	0
446	240.3	230.3	262.2	211.8	219.8	232.9	0
447	239.8	229.9	261.6	211.2	219.3	232.4	0
448	239.2	229.5	261.0	210.7	218.9	231.9	0
449	238.9	229.2	260.5	210.2	218.4	231.4	0
450	228.2	221.6	253.9	199.8	209.6	222.6	0
Average	413.4	271.1	333.0	295.4	294.6	321	0

Data from 12/20/2022 testing - Reference only



## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 4

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/20/2022

		Sample ID	Tare, mg	Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0125	186.5	190.1	3.6
	<b>B</b>	H0126	187.1	190.6	3.5
	<b>C - 1st Hour</b>	H0127	186.7	188.8	2.1
	<b>Amb</b>	H0149	90.6	90.7	0.1
<b>Probes</b>	<b>A</b>	14A	116632.9	116632.9	0.0
	<b>B</b>	14B	116618.6	116618.7	0.1
	<b>C - 1st Hour</b>	14C	116530.3	116530.2	0.0*
<b>O-rings</b>	<b>A</b>	14A	3367.1	3367.2	0.1
	<b>B</b>	14B	3342.1	3342.0	0.0*
	<b>C - 1st Hour</b>	14C	3446.7	3446.7	0.0

\*Negative value corrected to zero

**Placed in Dessicator on:** 12/26/2022

<b>Filters</b>	<b>A</b>	190.0	12/20 7:52	190.3	12/31 12:00	190.1	1/3 9:42		
	<b>B</b>	190.4	12/20 7:52	190.6	12/31 12:00	190.6	1/3 9:42		
	<b>C - 1st Hour</b>	190.1	12/20 7:52	188.9	12/31 12:00	188.8	1/3 9:43		
	<b>Amb</b>	90.6	12/20 7:52	90.6	12/31 12:12	90.7	1/3 9:43		
<b>Probes</b>	<b>A</b>			116633.1	12/31 12:09	116632.8	1/3 9:43	116632.9	1/4 12:21
	<b>B</b>			116619.0	12/31 12:09	116618.6	1/3 9:43	116618.7	1/4 12:21
	<b>C - 1st Hour</b>			116530.4	12/31 12:10	116530.2	1/3 9:43		
<b>O-Rings</b>	<b>A</b>			3367.1	12/31 12:00	3367.2	1/3 9:43		
	<b>B</b>			3342.0	12/31 12:00	3342.0	1/3 9:43		
	<b>C - 1st Hour</b>			3446.7	12/31 12:00	3446.7	1/3 9:43		

<b>Train A Aggregate, mg:</b>	<b>3.7</b>
<b>Train B Aggregate, mg:</b>	<b>3.6</b>
<b>Train C Aggregate, mg:</b>	<b>2.1</b>
<b>Ambient Aggregate, mg:</b>	<b>0.1</b>

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 5 Data Summary**

Client: SBI  
Model: J.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/21/2022

Data from 12/2022 testing - reference only

  
\_\_\_\_\_  
Technician Signature

7/12/2023  
\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBIModel: 1.7RRun #: 5Job #: 22-835Tracking #: 135Technician: AKDate: 12/21/2022

<b>Burn Rate (kg/hr):</b>	<b>3.93</b>
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	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	23.219	17.657	17.695	12.643
Average Gas Velocity in Dilution Tunnel (ft/sec)	23.20			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	26532.6			
Average Gas Meter Temperature (°F)	77.5	71.7	70.8	69.2
Total Sample Volume (dscf)	22.963	17.880	17.878	12.561
Average Tunnel Temperature (°F)	106.5			
Total Time of Test (min)	105			
Total Particulate Catch (mg)	0.0	2.2	2.3	1.8
Particulate Concentration, dry-standard (g/dscf)	0.000000	0.0001230	0.0001287	0.0001433
Total PM Emissions (g)	0.00	5.71	5.97	3.80
Particulate Emission Rate (g/hr)	0.00	3.26	3.41	3.80
Emissions Factor (g/kg)	-	0.82	0.86	-
Difference from Average Total Particulate Emissions (g)	-	0.13	0.13	-
Difference from Average Total Particulate Emissions (%)	-	2.2%	2.2%	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	5.84
Particulate Emission Rate (g/hr)	3.34
Emissions Factor (g/kg)	0.84
HHV Efficiency (%)	78.9%
LHV Efficiency (%)	84.5%
CO Emissions (g/min)	1.01

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: 82.6/Max: 87.4	OK
Face Velocity	< 30 ft/min	9.2	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:70.1/Max:81.9	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/21/22  
**Run:** 5  
**Control #:** 22-835  
**Test Duration:** 75  
**Output Category:** High

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	78.9%	84.5%
<b>Combustion Efficiency</b>	98.3%	98.3%
<b>Heat Transfer Efficiency</b>	80.2%	86.0%

<b>Output Rate (kJ/h)</b>	45,690	43,342	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	3.08	6.79	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	57,920	54,943	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	3.85	8.49	<b>dry lb</b>
<b>MC wet (%)</b>	17.32		
<b>MC dry (%)</b>	20.95		
<b>Particulate (g)</b>	5.84		
<b>CO (g)</b>	76		
<b>Test Duration (h)</b>	1.25		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.10	1.33
<b>g/kg Dry Fuel</b>	1.52	19.68
<b>g/h</b>	4.67	60.63
<b>g/min</b>	0.08	1.01
<b>lb/MM Btu Output</b>	0.24	3.08

<b>Air/Fuel Ratio (A/F)</b>	8.64
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VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/21/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.97  
 Max Allowable Start-up Fuel Weight (lbs): 4.46

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	15.75	2.47	In Range	26.9	19.5	19.9	22.1	In Range	2.02	0.92	
2	16.00	3.18	In Range	26.8	16.2	15.9	19.6	In Range	2.66	1.21	
3	15.75	3.04	In Range	28.2	15.4	15.4	19.7	In Range	2.54	1.15	
Core Load Wt. (lbs)		8.69	In Range								

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	15.75	2.47	In Range	22.7	26.8	16.8	22.1	In Range	2.02	0.92	
2	16.25	3.70	In Range	30.3	18.4	16.2	21.6	In Range	3.04	1.38	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.17	In Range								

Total Load Weight (lbs): 14.86 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: 103% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.3  
 Total Load Average Moisture Content (%DB): 20.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 17.3  
 Total Test Load Weight (dry basis): 12.29 lbs 5.57 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.85	In Range	10	10	10	10.0	In Range	2.59	1.17

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.44	In Range	27.1	15.1	17.7	20.0	In Range	3.70	1.68

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.5 to 3.0  
 Actual Residual Start-up Fuel Weight (lb): 1.77 In Range

### TEST END POINT

High Fire Test Run End Point Range: 1.3 to 1.63 lb  
 Actual Fuel Load Ending Weight (lb): 1.45 In Range

Total Weight All Fuel Added: 22.15 lbs, wet basis  
 18.58 lbs, dry basis  
 8.43 kg, dry basis

Total Weight All Fuel Burned (dry basis): 15.36 lbs  
 6.97 kg

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5  
 Test Start Time: 10:42  
 Test Type: High Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 105  
 High Fire Test Load Time (min): 30

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.85	29.82	29.84
Relative Humidity (%)	25.9	25.7	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	23.219 ft <sup>3</sup>		

**Sample Train Post-Test Leak Checks**

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

### DILUTION TUNNEL FLOW

#### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.111	70
2	0.134	70
3	0.133	70
4	0.118	70
5	0.094	70
6	0.128	70
7	0.135	70
8	0.119	70
Center	0.137	70

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

$V_{strav}$ : 23.14 ft/sec  
 $V_{scent}$ : 24.61 ft/sec  
 $F_p$ : 0.940 [ratio]  
 Initial Tunnel Flow: 471.7 scf/min

Static Pressure: -0.284 in. H<sub>2</sub>O

### 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

**WOODSTOVE PREBURN DATA**

Client: SBI  
Model: 1.7R  
Run #: 5

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/21/2022

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

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.137	0.00	71.7	0.28		7.29		74.4	118.7	83.0	70.1
1			0.137	0.00	71.7	0.29	-	7.19	-0.09	75.6	156.3	82.8	70.1
2			0.137	0.00	71.7	0.30	-	7.74	0.55	73.3	186.6	82.8	70.2
3			0.136	0.00	71.6	0.33	-	6.98	-0.76	75.3	258.6	82.7	70.2
4			0.136	0.00	71.6	0.33	-	6.84	-0.14	77.5	332.1	83.2	70.4
5			0.134	0.00	71.5	0.36	-	6.63	0.24	79.5	385.1	83.6	70.6
6			0.134	0.00	71.5	0.39	-	6.44	-0.19	81.2	423.0	83.8	71.2
7			0.133	0.00	71.5	0.40	-	6.26	-0.17	82.9	454.5	83.9	71.3
8			0.133	0.00	71.5	0.42	-	6.07	-0.20	85.0	477.7	84.0	71.7
9			0.131	0.00	71.5	0.44	-	5.90	-0.17	86.4	486.7	84.1	71.7
10	1.693	0.169	0.130	0.00	71.6	0.46	97	5.71	-0.19	87.9	499.3	84.3	71.8
11			0.130	0.00	71.6	0.45	-	5.47	-0.23	90.8	537.9	84.5	71.9
12			0.130	0.00	71.5	0.48	-	5.21	-0.26	92.9	567.5	84.8	72.2
13			0.130	0.00	71.5	0.47	-	4.99	-0.22	94.3	578.0	84.9	72.5
14			0.129	0.00	71.4	0.47	-	4.78	-0.21	95.2	578.2	85.2	72.7
15			0.129	0.00	71.4	0.48	-	4.55	-0.23	96.0	574.9	85.4	73.0
16			0.128	0.00	71.3	0.48	-	4.35	-0.21	96.4	571.6	85.5	73.4
17			0.128	0.00	71.4	0.46	-	4.14	-0.21	96.9	569.3	85.7	73.6
18			0.129	0.00	71.4	0.46	-	3.91	-0.23	97.8	575.0	85.9	73.9
19			0.130	0.00	71.4	0.46	-	3.67	-0.24	98.9	585.7	85.9	74.1
20	3.381	0.169	0.129	0.00	71.5	0.47	99	3.44	-0.23	99.6	589.0	85.8	74.3
21			0.128	0.00	71.5	0.49	-	3.23	-0.22	100.3	591.8	85.7	74.7
22			0.127	0.00	71.4	0.48	-	2.99	-0.23	101.4	600.5	85.8	75.1
23			0.130	0.00	71.4	0.48	-	2.77	-0.23	102.3	615.1	86.0	75.4
24			0.129	0.00	71.5	0.48	-	2.55	-0.22	103.1	620.2	86.2	75.6
25			0.130	0.00	71.4	0.49	-	2.38	-0.17	102.3	615.5	86.3	75.5
26			0.131	0.00	71.3	0.49	-	2.22	-0.16	98.2	599.4	86.5	76.1
27			0.131	0.00	71.4	0.49	-	2.07	-0.15	96.8	589.5	86.5	77.0
28			0.131	0.00	71.3	0.48	-	1.92	-0.15	96.4	583.6	86.4	77.8
29			0.128	0.00	71.4	0.49	-	1.78	-0.14	98.4	578.5	86.5	76.9
30	5.071	0.169	0.121	0.00	71.4	0.52	103	11.71	9.93	134.2	582.7	86.9	75.2
31			0.127	0.00	71.4	0.52	-	14.54	2.83	123.1	545.2	85.1	75.5
32			0.130	0.00	71.5	0.52	-	14.38	-0.16	106.9	551.9	84.7	75.8



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.130	0.00	71.5	0.52	-	14.21	-0.17	103.7	564.0	84.4	75.8
34			0.130	0.00	71.6	0.53	-	14.01	-0.20	103.2	569.9	85.1	76.7
35			0.131	0.00	71.6	0.52	-	13.83	-0.18	103.4	568.1	85.6	77.5
36			0.127	0.00	71.6	0.51	-	13.66	-0.17	103.9	563.4	86.0	77.8
37			0.129	0.00	71.6	0.51	-	13.50	-0.16	103.9	559.2	86.2	77.9
38			0.128	0.00	71.6	0.52	-	13.34	-0.16	103.8	554.1	86.5	77.9
39			0.128	0.00	71.7	0.53	-	13.19	-0.15	103.9	549.4	86.6	78.1
40	6.769	0.170	0.127	0.00	71.7	0.51	104	13.04	-0.15	103.9	546.0	86.7	78.5
41			0.129	0.00	71.6	0.52	-	12.90	-0.14	103.8	541.4	86.6	78.3
42			0.129	0.00	71.6	0.52	-	12.75	-0.15	103.4	534.8	86.6	78.5
43			0.130	0.00	71.6	0.52	-	12.61	-0.14	103.4	532.1	86.8	78.7
44			0.131	0.00	71.6	0.51	-	12.49	-0.12	100.6	529.9	86.8	79.2
45			0.129	0.00	71.6	0.51	-	12.34	-0.15	102.0	529.2	86.9	80.0
46			0.130	0.00	71.6	0.51	-	12.19	-0.15	102.9	528.1	87.0	79.7
47			0.130	0.00	71.5	0.51	-	12.05	-0.14	103.3	528.9	86.2	79.3
48			0.131	0.00	71.6	0.51	-	11.91	-0.14	103.0	529.0	85.4	79.0
49			0.132	0.00	71.5	0.51	-	11.77	-0.14	102.5	528.2	84.9	79.9
50	8.463	0.169	0.130	0.00	71.5	0.51	101	11.63	-0.14	102.8	529.2	84.4	80.3
51			0.132	0.00	71.4	0.51	-	11.48	-0.15	103.3	532.9	84.0	80.4
52			0.129	0.00	71.3	0.51	-	11.32	-0.16	104.0	538.1	83.8	80.8
53			0.130	0.00	71.3	0.50	-	11.14	-0.17	104.7	545.1	83.4	81.1
54			0.129	0.00	71.3	0.51	-	10.98	-0.16	105.1	550.2	83.2	81.1
55			0.129	0.00	71.4	0.50	-	10.80	-0.18	105.7	557.2	82.8	81.0
56			0.130	0.00	71.3	0.50	-	10.61	-0.19	106.2	562.7	82.6	81.1
57			0.127	0.00	71.3	0.50	-	10.43	-0.18	107.1	577.9	82.9	81.8
58			0.129	0.00	71.3	0.52	-	10.20	-0.23	108.7	602.1	83.3	81.9
59			0.125	0.00	71.4	0.51	-	9.96	-0.24	110.4	622.7	83.3	81.9
60	10.154	0.169	0.126	0.00	71.4	0.52	101	9.72	-0.24	111.9	641.8	83.6	81.4
61			0.127	0.00	71.6	0.52	-	9.53	-0.20	112.5	660.6	83.9	79.1
62			0.126	0.00	71.6	0.54	-	9.32	-0.20	112.5	678.1	84.3	78.1
63			0.129	0.00	71.7	0.54	-	9.11	-0.22	113.0	692.9	84.5	77.6
64			0.127	0.00	71.8	0.54	-	8.89	-0.22	114.3	718.5	84.8	77.0
65			0.128	0.00	71.9	0.55	-	8.62	-0.26	116.1	751.8	85.1	77.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.127	0.00	72.0	0.54	-	8.36	-0.27	118.1	776.1	85.3	78.1
67			0.127	0.00	72.0	0.56	-	8.06	-0.29	119.1	785.6	85.5	78.2
68			0.125	0.00	72.0	0.57	-	7.80	-0.27	120.1	791.2	85.7	78.3
69			0.126	0.00	72.0	0.57	-	7.53	-0.27	120.3	788.5	85.8	77.9
70	11.834	0.168	0.125	0.00	72.0	0.57	102	7.28	-0.25	120.4	780.0	85.9	78.0
71			0.125	0.00	72.0	0.58	-	7.02	-0.26	120.1	774.1	86.2	78.7
72			0.125	0.00	71.9	0.58	-	6.78	-0.24	120.0	770.4	86.4	78.1
73			0.126	0.00	71.9	0.58	-	6.52	-0.26	120.4	772.5	86.6	78.1
74			0.125	0.00	71.9	0.59	-	6.27	-0.25	120.4	776.2	86.7	77.8
75			0.125	0.00	71.9	0.59	-	6.03	-0.24	121.1	784.1	86.9	77.7
76			0.126	0.00	71.9	0.60	-	5.76	-0.26	121.7	791.5	86.8	79.0
77			0.124	0.00	72.0	0.60	-	5.51	-0.25	122.5	798.0	86.5	78.7
78			0.124	0.00	72.0	0.60	-	5.24	-0.27	123.1	803.6	86.4	78.6
79			0.124	0.00	71.9	0.60	-	4.99	-0.25	123.4	802.4	86.0	78.8
80	13.510	0.168	0.125	0.00	71.9	0.61	103	4.73	-0.26	123.7	803.8	85.8	79.3
81			0.126	0.00	72.0	0.62	-	4.48	-0.25	124.1	804.6	85.8	79.2
82			0.124	0.00	71.9	0.62	-	4.23	-0.25	124.0	800.7	85.7	78.6
83			0.121	0.00	72.0	0.63	-	4.00	-0.23	123.7	786.0	85.7	79.9
84			0.121	0.00	72.0	0.63	-	3.81	-0.19	122.6	767.5	85.5	80.2
85			0.122	0.00	72.0	0.65	-	3.61	-0.19	121.8	757.0	85.4	80.3
86			0.124	0.00	72.0	0.65	-	3.40	-0.21	121.3	752.4	85.4	80.1
87			0.126	0.00	72.0	0.67	-	3.21	-0.19	120.6	748.7	85.1	79.6
88			0.126	0.00	72.0	0.67	-	3.02	-0.19	120.4	741.3	85.0	79.3
89			0.128	0.00	72.1	0.65	-	2.85	-0.18	119.4	729.7	84.9	80.2
90	15.157	0.165	0.128	0.00	72.0	0.67	100	2.69	-0.16	118.2	717.5	84.6	80.6
91			0.127	0.00	72.0	0.67	-	2.53	-0.16	117.4	707.2	84.6	80.2
92			0.126	0.00	71.9	0.68	-	2.37	-0.16	116.6	692.5	84.5	80.6
93			0.130	0.00	71.9	0.68	-	2.24	-0.13	115.2	674.6	84.4	80.6
94			0.130	0.00	71.8	0.69	-	2.12	-0.13	114.1	657.7	84.4	79.7
95			0.127	0.00	71.9	0.69	-	2.04	-0.08	112.8	644.0	84.3	80.4
96			0.130	0.00	71.9	0.69	-	1.94	-0.09	111.6	632.1	84.2	80.6
97			0.131	0.00	71.9	0.69	-	1.85	-0.09	110.8	621.4	84.0	80.3
98			0.131	0.00	71.9	0.70	-	1.78	-0.07	110.1	612.6	83.8	80.5

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.130	0.00	71.9	0.70	-	1.72	-0.05	109.5	603.6	83.8	79.9
100	16.820	0.166	0.128	0.00	71.9	0.69	100	1.66	-0.07	108.8	595.1	83.5	79.4
101			0.130	0.00	71.9	0.69	-	1.59	-0.07	108.0	585.7	83.5	79.9
102			0.132	0.00	71.8	0.69	-	1.54	-0.05	107.1	575.2	83.3	80.4
103			0.131	0.00	71.9	0.68	-	1.48	-0.05	106.3	565.8	83.4	79.3
104			0.132	0.00	71.9	0.68	-	1.45	-0.04	105.5	555.8	83.2	80.0
105	17.657	0.167	0.131	0.00	71.9	0.68	100	1.44	-0.01	105.4	555.6	83.2	80.0
Avg/Tot	17.657	0.168	0.129	0.00	71.7	0.54	101			106.5	606.4	85.0	77.5

Data from 12/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	71.0	0.45		86.2	-0.035	1.70	0.000	27.4	34.0
1			0.00	71.0	0.51	-	86.4	-0.041	1.73	0.000	29.4	39.9
2			0.00	71.0	0.43	-	86.2	-0.053	4.42	0.047	28.0	40.5
3			0.00	71.0	0.55	-	86.2	-0.072	8.08	0.071	29.8	39.0
4			0.00	70.9	0.50	-	86.3	-0.078	10.09	0.149	33.8	43.7
5			0.00	70.8	0.52	-	86.3	-0.083	11.08	0.139	35.4	47.1
6			0.00	70.8	0.60	-	86.2	-0.085	11.59	0.282	35.3	48.9
7			0.00	70.8	0.64	-	86.4	-0.088	11.76	0.286	34.7	49.8
8			0.00	70.8	0.57	-	86.4	-0.091	11.58	0.168	34.2	50.9
9			0.00	70.8	0.66	-	86.6	-0.090	11.67	0.054	32.5	51.1
10	1.719	0.172	0.00	70.8	0.57	99	86.6	-0.092	11.38	0.016	31.1	51.3
11			0.00	70.8	0.63	-	86.7	-0.099	13.72	0.151	30.3	51.8
12			0.00	70.8	0.62	-	86.8	-0.101	15.45	0.560	31.2	55.0
13			0.00	70.7	0.70	-	87.1	-0.101	14.40	0.444	30.4	56.3
14			0.00	70.6	0.71	-	87.3	-0.100	13.46	0.262	28.8	56.1
15			0.00	70.6	0.72	-	87.4	-0.099	13.41	0.364	27.5	55.4
16			0.00	70.5	0.63	-	87.3	-0.098	13.22	0.270	27.1	55.8
17			0.00	70.6	0.63	-	87.3	-0.099	13.54	0.234	26.7	55.8
18			0.00	70.6	0.62	-	87.3	-0.101	14.48	0.240	26.3	55.9
19			0.00	70.6	0.70	-	86.7	-0.102	14.99	0.342	26.3	56.7
20	3.414	0.169	0.00	70.7	0.65	99	86.4	-0.099	15.03	0.237	26.1	57.2
21			0.00	70.7	0.63	-	86.0	-0.100	14.99	0.337	25.0	56.7
22			0.00	70.6	0.67	-	85.5	-0.102	15.31	0.343	24.5	56.8
23			0.00	70.6	0.73	-	85.0	-0.103	16.01	0.427	24.1	57.0
24			0.00	70.6	0.64	-	84.7	-0.103	15.90	0.354	23.7	57.4
25			0.00	70.6	0.71	-	84.2	-0.102	14.90	0.248	22.8	57.0
26			0.00	70.4	0.64	-	83.9	-0.099	13.31	0.086	21.7	55.6
27			0.00	70.5	0.72	-	83.5	-0.099	12.66	0.016	22.3	52.7
28			0.00	70.4	0.70	-	83.1	-0.098	12.68	0.022	22.3	51.6
29			0.00	70.5	0.68	-	82.8	-0.098	12.49	0.023	22.3	51.3
30	5.108	0.169	0.00	70.5	0.71	103	82.7	-0.107	6.53	0.027	21.6	51.3
31			0.00	70.6	0.73	-	82.8	-0.095	3.80	0.086	13.3	57.9
32			0.00	70.6	0.73	-	82.9	-0.099	11.10	0.018	12.7	54.9
33			0.00	70.6	0.66	-	83.2	-0.100	12.38	0.028	19.3	55.4
34			0.00	70.7	0.74	-	83.7	-0.099	13.00	0.000	20.7	55.8
35			0.00	70.7	0.71	-	84.1	-0.099	12.12	0.000	21.2	55.8
36			0.00	70.7	0.66	-	84.7	-0.098	11.33	0.000	20.7	55.2
37			0.00	70.7	0.70	-	85.0	-0.097	10.87	0.005	20.5	54.9
38			0.00	70.7	0.71	-	85.5	-0.097	10.55	0.033	20.1	54.5

Data from 12/21/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	70.7	0.73	-	85.8	-0.096	10.35	0.038	20.0	54.1
40	6.806	0.170	0.00	70.8	0.66	104	85.8	-0.096	10.11	0.065	19.9	54.0
41			0.00	70.7	0.73	-	85.9	-0.096	9.67	0.124	19.7	53.8
42			0.00	70.8	0.72	-	85.9	-0.094	9.17	0.201	19.5	53.4
43			0.00	70.8	0.67	-	86.0	-0.096	9.13	0.237	19.4	53.1
44			0.00	70.7	0.73	-	86.0	-0.095	9.35	0.237	19.3	53.1
45			0.00	70.7	0.73	-	86.1	-0.096	9.35	0.232	20.5	52.2
46			0.00	70.7	0.73	-	86.1	-0.094	9.27	0.295	20.2	53.1
47			0.00	70.7	0.74	-	86.2	-0.096	9.46	0.138	19.8	53.2
48			0.00	70.8	0.68	-	86.0	-0.095	9.45	0.210	19.7	53.2
49			0.00	70.7	0.67	-	85.8	-0.097	9.43	0.186	19.8	53.2
50	8.500	0.169	0.00	70.7	0.72	100	86.0	-0.095	9.65	0.133	20.1	53.2
51			0.00	70.6	0.73	-	86.0	-0.096	10.09	0.119	20.3	53.8
52			0.00	70.5	0.74	-	86.1	-0.098	10.69	0.068	20.3	54.1
53			0.00	70.4	0.70	-	86.1	-0.099	11.29	0.072	20.3	54.7
54			0.00	70.4	0.67	-	86.2	-0.099	11.65	0.050	20.3	55.2
55			0.00	70.4	0.66	-	86.2	-0.099	11.89	0.098	20.3	55.6
56			0.00	70.4	0.66	-	86.1	-0.099	12.03	0.101	20.3	56.1
57			0.00	70.4	0.73	-	86.0	-0.102	12.89	0.330	20.3	56.5
58			0.00	70.4	0.71	-	86.1	-0.105	14.60	0.331	20.5	57.4
59			0.00	70.4	0.70	-	86.4	-0.107	15.23	0.552	20.7	59.0
60	10.188	0.169	0.00	70.5	0.75	101	86.4	-0.109	15.91	0.533	20.5	60.1
61			0.00	70.6	0.68	-	86.6	-0.109	16.38	0.497	20.3	60.8
62			0.00	70.7	0.75	-	86.8	-0.109	16.65	0.567	20.1	61.3
63			0.00	70.7	0.69	-	86.9	-0.109	17.09	0.614	20.4	61.7
64			0.00	70.8	0.74	-	87.1	-0.109	17.42	0.679	20.3	61.9
65			0.00	70.9	0.70	-	87.2	-0.109	18.37	0.575	20.1	62.6
66			0.00	71.0	0.78	-	87.2	-0.109	18.88	0.663	19.7	63.5
67			0.00	71.0	0.73	-	87.2	-0.109	19.43	0.694	19.2	64.4
68			0.00	71.0	0.77	-	86.9	-0.109	19.36	0.601	18.8	64.6
69			0.00	71.0	0.73	-	86.7	-0.109	19.17	0.532	18.3	64.8
70	11.869	0.168	0.00	71.0	0.77	102	86.4	-0.109	18.85	0.448	17.9	64.4
71			0.00	71.0	0.71	-	86.2	-0.109	18.71	0.377	17.8	64.0
72			0.00	71.0	0.80	-	85.9	-0.109	18.71	0.372	17.5	63.7
73			0.00	71.0	0.77	-	85.7	-0.109	18.81	0.319	17.5	63.5
74			0.00	71.0	0.72	-	85.5	-0.109	18.93	0.305	17.3	63.5
75			0.00	71.0	0.77	-	85.2	-0.109	19.23	0.335	17.3	63.3
76			0.00	71.0	0.73	-	85.3	-0.109	19.43	0.343	17.1	63.5
77			0.00	71.0	0.71	-	85.2	-0.109	19.57	0.404	16.8	63.7

Data from 12/21/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	71.0	0.79	-	85.0	-0.109	19.72	0.584	16.6	63.9
79			0.00	71.0	0.80	-	85.1	-0.109	19.73	0.798	16.4	63.9
80	13.545	0.168	0.00	71.0	0.75	102	85.1	-0.109	19.72	0.812	16.3	63.7
81			0.00	71.0	0.75	-	85.1	-0.109	19.73	0.760	16.1	63.3
82			0.00	71.0	0.78	-	84.9	-0.109	19.73	0.689	15.9	63.0
83			0.00	71.0	0.82	-	84.9	-0.109	19.57	0.309	15.7	62.6
84			0.00	71.0	0.77	-	84.7	-0.109	18.06	0.200	15.4	62.1
85			0.00	71.0	0.84	-	84.6	-0.109	17.80	0.214	15.2	61.5
86			0.00	71.1	0.82	-	84.7	-0.109	18.00	0.210	15.3	61.0
87			0.00	71.1	0.79	-	84.6	-0.109	18.28	0.221	15.3	60.8
88			0.00	71.1	0.78	-	84.5	-0.109	18.18	0.215	15.4	60.4
89			0.00	71.1	0.81	-	84.4	-0.109	17.32	0.128	15.3	59.9
90	15.192	0.165	0.00	71.1	0.89	100	84.4	-0.109	16.50	0.091	15.0	58.8
91			0.00	71.1	0.82	-	84.4	-0.108	15.84	0.082	15.0	57.7
92			0.00	71.0	0.82	-	84.3	-0.107	15.03	0.115	14.9	57.0
93			0.00	71.1	0.89	-	84.2	-0.105	13.84	0.062	14.8	56.1
94			0.00	71.0	0.90	-	84.1	-0.104	12.75	0.038	14.5	54.5
95			0.00	71.0	0.87	-	84.0	-0.103	12.01	0.000	14.2	53.4
96			0.00	71.0	0.89	-	83.9	-0.103	11.44	0.000	14.3	52.3
97			0.00	71.1	0.85	-	83.9	-0.101	11.14	0.000	14.4	51.6
98			0.00	71.0	0.81	-	83.7	-0.100	10.81	0.000	14.2	50.7
99			0.00	71.1	0.84	-	83.7	-0.099	10.49	0.000	14.2	50.2
100	16.857	0.167	0.00	71.0	0.87	99	83.6	-0.100	10.14	0.000	14.1	49.5
101			0.00	71.1	0.87	-	83.5	-0.097	9.72	0.000	13.9	48.6
102			0.00	71.0	0.82	-	83.4	-0.096	9.30	0.000	13.8	47.7
103			0.00	71.1	0.88	-	83.3	-0.095	8.87	0.000	13.7	46.8
104			0.00	71.1	0.83	-	83.1	-0.092	8.54	0.000	13.6	46.0
105	17.695	0.168	0.00	71.1	0.90	101	83.1	-0.093	8.54	0.000	13.5	45.1
Avg/Tot	17.695	0.168	0.00	70.8	0.72	101	85.4	-0.099	13.42	0.232	20.56	55.498

Data from 12/21/2022 testing - Reference only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	68.9	0.00		83.4
1			0.00	68.9	0.00	-	83.3
2			0.00	69.0	0.00	-	82.9
3			0.00	68.9	0.00	-	83.0
4			0.00	68.9	0.00	-	83.5
5			0.00	68.9	0.00	-	84.0
6			0.00	69.0	0.00	-	84.3
7			0.00	68.9	0.00	-	84.7
8			0.00	68.9	0.00	-	84.9
9			0.00	69.0	0.00	-	85.2
10	2.098	0.210	0.00	69.0	0.00	96	85.6
11			0.00	69.0	0.00	-	86.1
12			0.00	69.0	0.00	-	86.7
13			0.00	69.0	0.00	-	87.0
14			0.00	69.0	0.00	-	87.4
15			0.00	69.0	0.00	-	87.4
16			0.00	69.0	0.00	-	87.3
17			0.00	69.0	0.00	-	87.2
18			0.00	69.1	0.00	-	87.3
19			0.00	69.1	0.00	-	87.1
20	4.154	0.206	0.00	69.1	0.00	96	86.8
21			0.00	69.1	0.00	-	86.6
22			0.00	69.1	0.00	-	86.5
23			0.00	69.0	0.00	-	86.4
24			0.00	69.0	0.00	-	86.3
25			0.00	69.1	0.00	-	86.1
26			0.00	69.1	0.00	-	85.5
27			0.00	69.0	0.00	-	85.1
28			0.00	69.1	0.00	-	84.6
29			0.00	69.0	0.00	-	84.5
30	6.230	0.208	0.00	69.1	0.00	101	87.5
31			0.00	69.1	0.00	-	86.7

Data from 12/2022 testing - Reference only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	69.2	0.00	-	82.9
33			0.00	69.2	0.00	-	82.7
34			0.00	69.2	0.00	-	83.9
35			0.00	69.2	0.00	-	85.1
36			0.00	69.3	0.00	-	86.0
37			0.00	69.3	0.00	-	86.7
38			0.00	69.3	0.00	-	87.6
39			0.00	69.4	0.00	-	87.9
40	8.321	0.209	0.00	69.5	0.00	102	87.6
41			0.00	69.5	0.00	-	87.4
42			0.00	69.5	0.00	-	87.3
43			0.00	69.5	0.00	-	87.3
44			0.00	69.5	0.00	-	87.0
45			0.00	69.5	0.00	-	86.9
46			0.00	69.5	0.00	-	87.1
47			0.00	69.4	0.00	-	87.0
48			0.00	69.5	0.00	-	86.8
49			0.00	69.5	0.00	-	86.4
50	10.443	0.212	0.00	69.5	0.00	100	86.4
51			0.00	69.5	0.00	-	86.3
52			0.00	69.5	0.00	-	86.3
53			0.00	69.5	0.00	-	86.3
54			0.00	69.5	0.00	-	86.2
55			0.00	69.5	0.00	-	86.1
56			0.00	69.5	0.00	-	86.1
57			0.00	69.5	0.00	-	86.2
58			0.00	69.5	0.00	-	86.6
59			0.00	69.5	0.00	-	86.8
60	12.643	0.220	0.00	69.5	0.00	105	4184.7
Avg/Tot	12.643	0.211	0.00	69.2	0.00	100	153.2

Data from 12/2022 testing - Reference only



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	83.9	70.1	70.6	70.4	70.2	73.0	0
1	101.1	70.0	71.2	70.5	70.2	76.6	0
2	119.4	70.0	72.8	70.7	70.4	80.7	0
3	160.6	70.0	75.3	71.4	70.9	89.6	0
4	229.6	70.0	78.9	72.3	71.6	104.5	0
5	301.1	70.1	84.1	73.8	72.7	120.4	0
6	367.8	70.2	90.8	75.9	74.2	135.8	0
7	426.3	70.5	98.4	78.5	76.3	150.0	0
8	475.9	70.9	106.6	81.9	79.0	162.8	0
9	514.6	71.4	114.9	86.0	82.3	173.8	0
10	540.7	72.1	122.9	90.5	86.0	182.5	0
11	570.1	72.9	130.6	95.8	90.3	191.9	0
12	607.8	73.9	138.4	101.7	95.3	203.4	0
13	641.6	75.0	146.3	107.9	100.9	214.4	0
14	669.5	76.6	154.1	114.4	107.0	224.3	0
15	692.3	78.4	161.6	121.1	113.5	233.4	0
16	709.3	80.7	169.3	127.6	120.5	241.5	0
17	723.1	83.4	177.4	133.6	127.8	249.0	0
18	735.5	86.6	186.2	140.0	135.3	256.8	0
19	748.2	90.3	195.9	146.4	142.9	264.8	0
20	760.3	94.4	205.4	153.2	150.6	273.0	0
21	771.2	98.8	215.5	160.6	158.3	281.3	0
22	782.4	103.6	228.8	168.5	166.0	289.9	0
23	795.5	108.6	240.2	176.7	173.4	298.9	0
24	809.1	113.8	251.6	185.1	180.6	308.1	0
25	818.5	119.3	263.1	193.7	188.3	316.6	0
26	821.6	125.2	274.2	202.4	196.3	324.0	0
27	821.7	131.4	284.9	211.4	204.4	330.8	0
28	821.0	137.8	295.0	220.4	212.5	337.3	0
29	818.1	144.2	304.8	229.0	220.6	343.3	0
30	800.9	151.3	316.3	237.7	229.3	347.1	0
31	765.5	158.4	328.3	245.9	237.3	347.1	0
32	748.5	164.8	333.5	253.9	244.7	349.1	0
33	742.1	171.2	333.5	261.5	251.6	352.0	0
34	741.6	177.8	331.4	268.8	258.2	355.6	0
35	741.5	183.9	328.6	275.1	263.8	358.6	0
36	739.0	189.9	326.1	281.1	269.0	361.0	0
37	734.3	195.6	323.8	286.6	273.5	362.8	0
38	728.8	201.0	321.8	291.4	277.2	364.0	0
39	722.3	206.0	320.0	295.8	280.4	364.9	0
40	715.2	210.5	318.5	299.7	283.1	365.4	0
41	708.9	214.9	317.2	303.3	285.4	365.9	0
42	701.8	219.0	316.0	306.5	287.4	366.1	0
43	695.0	222.7	315.0	309.5	289.1	366.2	0
44	689.6	226.5	314.2	312.2	290.8	366.7	0
45	685.8	229.9	313.3	314.4	292.1	367.1	0
46	682.9	233.2	312.5	316.6	292.9	367.6	0
47	681.1	236.2	311.9	318.6	293.6	368.3	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	679.4	239.1	311.4	320.5	294.3	368.9	0
49	676.5	241.9	310.9	322.1	294.9	369.3	0
50	674.5	244.7	310.7	323.7	295.4	369.8	0
51	673.7	247.5	310.5	325.1	295.7	370.5	0
52	674.5	250.3	310.5	326.4	296.1	371.6	0
53	676.7	252.9	310.7	327.7	296.4	372.9	0
54	679.8	255.6	311.1	328.8	296.8	374.4	0
55	685.1	258.2	311.7	329.7	297.4	376.4	0
56	690.8	260.8	312.4	330.7	298.3	378.6	0
57	697.8	263.4	313.3	331.6	299.3	381.1	0
58	708.3	266.0	314.2	332.6	300.6	384.3	0
59	721.6	268.6	315.1	333.6	302.1	388.2	0
60	737.3	271.3	316.4	334.5	303.9	392.7	0
61	752.5	273.2	318.0	334.3	305.4	396.7	0
62	767.5	274.9	319.9	334.8	307.5	400.9	0
63	781.9	276.7	322.0	335.7	309.6	405.2	0
64	794.4	278.7	324.3	336.8	312.2	409.3	0
65	805.9	280.7	327.0	338.4	315.2	413.4	0
66	817.6	283.0	330.1	340.1	318.5	417.9	0
67	830.4	285.6	333.6	342.0	321.9	422.7	0
68	843.3	288.3	337.7	344.0	325.6	427.8	0
69	855.7	291.0	341.9	346.2	329.4	432.8	0
70	866.3	293.8	346.2	348.3	333.3	437.6	0
71	875.4	296.7	350.5	350.9	337.2	442.2	0
72	884.5	299.8	355.1	353.3	341.2	446.8	0
73	892.6	303.0	359.9	355.6	345.3	451.3	0
74	900.0	306.2	364.7	358.2	349.3	455.7	0
75	907.2	309.5	369.7	360.6	353.1	460.0	0
76	914.1	312.9	375.1	363.3	357.0	464.5	0
77	920.6	316.3	380.6	365.7	360.7	468.8	0
78	926.7	319.8	386.3	368.4	364.3	473.1	0
79	933.0	323.4	392.2	370.8	367.9	477.5	0
80	939.1	327.1	398.3	373.5	371.3	481.8	0
81	944.3	331.0	404.5	376.2	374.7	486.1	0
82	948.9	334.8	410.9	379.0	377.7	490.3	0
83	952.4	338.8	417.4	381.7	380.9	494.3	0
84	952.6	342.6	424.4	384.1	384.1	497.5	0
85	951.5	346.6	431.3	386.9	387.0	500.7	0
86	952.0	350.6	438.3	389.5	390.1	504.1	0
87	954.5	354.5	445.4	392.0	393.0	507.9	0
88	957.9	358.4	452.6	394.3	396.0	511.8	0
89	959.1	362.2	459.8	396.6	398.9	515.3	0
90	955.4	366.3	467.0	399.0	401.9	517.9	0
91	947.6	370.2	474.2	401.4	404.8	519.7	0
92	936.1	374.1	481.3	403.5	407.7	520.5	0
93	921.8	378.1	488.2	405.8	410.5	520.9	0
94	905.4	382.1	494.6	407.7	413.3	520.6	0
95	888.4	386.0	500.6	409.3	415.8	520.0	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
96	872.2	390.0	506.5	411.2	418.3	519.6	0
97	857.0	393.9	512.4	413.3	420.4	519.4	0
98	843.0	397.7	518.3	415.0	422.6	519.3	0
99	829.9	401.4	524.7	416.3	424.3	519.3	0
100	816.5	404.9	531.5	417.7	426.0	519.3	0
101	803.1	408.4	538.5	419.3	427.5	519.4	0
102	789.6	411.8	545.5	420.3	428.8	519.2	0
103	776.0	415.1	551.7	421.5	429.7	518.8	0
104	762.0	418.2	557.3	422.2	430.7	518.1	0
105	761.7	418.2	557.4	422.3	430.7	518.0	0
Average	744.2	235.5	321.0	286.6	277.4	373	0

Data from 12/2022 testing - Reference only

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 5

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

		Sample ID	Tare, mg		Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0128	187.5		189.7	2.2
	<b>B</b>	H0129	187.4		189.6	2.2
	<b>C - 1st Hour</b>	H0130	187.9		189.7	1.8
	<b>Amb</b>	H0150	89.5		89.5	0.0
<b>Probes</b>	<b>A</b>	15A	117239.3		117239.3	0.0
	<b>B</b>	15B	116752.0		116752.1	0.1
	<b>C - 1st Hour</b>	15C	116847.4		116847.4	0.0
<b>O-rings</b>	<b>A</b>	15A	3570.6		3570.6	0.0
	<b>B</b>	15B	3571.8		3571.8	0.0
	<b>C - 1st Hour</b>	15C	3397.5		3397.5	0.0

**Placed in Dessicator on:** 12/26/2022

<b>Filters</b>	<b>A</b>	190.2	12/21 2:11	189.9	12/31 12:00	189.7	1/3 9:43		
	<b>B</b>	190.2	12/21 2:11	189.7	12/31 12:00	189.6	1/3 9:43		
	<b>C - 1st Hour</b>	190.3	12/21 2:11	189.9	12/31 12:00	189.7	1/3 9:43		
	<b>Amb</b>	89.6	12/21 2:11	89.5	12/31 12:13	89.5	1/3 9:44		
<b>Probes</b>	<b>A</b>			117239.6	12/31 12:09	117239.3	1/3 9:44	117239.3	1/4 12:22
	<b>B</b>			116752.2	12/31 12:09	116752.1	1/3 9:44		
	<b>C - 1st Hour</b>			116847.4	12/31 12:09	116847.4	1/3 9:44		
<b>O-Rings</b>	<b>A</b>			3570.6	12/31 12:01	3570.6	1/3 9:44		
	<b>B</b>			3572.0	12/31 12:01	3571.8	1/3 9:44		
	<b>C - 1st Hour</b>			3397.4	12/31 12:01	3397.5	1/3 9:44		

<b>Train A Aggregate, mg:</b>	<b>2.2</b>
<b>Train B Aggregate, mg:</b>	<b>2.3</b>
<b>Train C Aggregate, mg:</b>	<b>1.8</b>
<b>Ambient Aggregate, mg:</b>	<b>0.0</b>

**WOOD STOVE TEST DATA PACKET  
ASTM E3053/E2515**



**Run 6 Data Summary**

Client: SBI  
Model: J.7R  
Job #: 22-835  
Tracking #: 135  
Test Date: 12/21/2022

*Data from 12/21/2022 testing - reference only*

  
\_\_\_\_\_  
Technician Signature

7/12/2023  
\_\_\_\_\_  
Date

## TEST RESULTS - ASTM E3053 / ASTM E2515

Client: SBIModel: 1.7RRun #: 6Job #: 22-835Tracking #: 135Technician: AKDate: 12/21/2022

<b>Burn Rate (kg/hr):</b>	<b>1.45</b>
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	Sample Train C - 1st Hour
Total Sample Volume (ft <sup>3</sup> )	60.774	47.537	46.450	12.453
Average Gas Velocity in Dilution Tunnel (ft/sec)	23.34			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	27317.7			
Average Gas Meter Temperature (°F)	82.0	71.8	71.1	70.2
Total Sample Volume (dscf)	59.561	48.096	46.868	12.341
Average Tunnel Temperature (°F)	53.2			
Total Time of Test (min)	278			
Total Particulate Catch (mg)	0.1	3.1	3.2	2.7
Particulate Concentration, dry-standard (g/dscf)	0.0000017	0.0000645	0.0000683	0.0002188
Total PM Emissions (g)	0.21	7.95	8.43	5.93
Particulate Emission Rate (g/hr)	0.05	1.71	1.82	5.93
Emissions Factor (g/kg)	-	1.18	1.26	-
Difference from Average Total Particulate Emissions (g)	-	0.24	0.24	-
Difference from Average Total Particulate Emissions (%)	-	3.0%	3.0%	-
Difference from Average Emissions Factor (g/kg)	-	0.04	0.04	-

Final Average Results	
Total Particulate Emissions (g)	8.19
Particulate Emission Rate (g/hr)	1.77
Emissions Factor (g/kg)	1.22
HHV Efficiency (%)	71.1%
LHV Efficiency (%)	76.1%
CO Emissions (g/min)	1.33

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 80.9/Max: 88.3	OK
Face Velocity	< 30 ft/min	9.4	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:72.3/Max:87.4	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	All but 1 reading between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

## B415.1 Efficiency Results

**Manufacturer:** SBI  
**Model:** 1.7R  
**Date:** 12/21/22  
**Run:** 6  
**Control #:** 22-835  
**Test Duration:** 278  
**Output Category:** Medium

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	71.1%	76.1%
<b>Combustion Efficiency</b>	96.1%	96.1%
<b>Heat Transfer Efficiency</b>	74.0%	79.2%

<b>Output Rate (kJ/h)</b>	19,352	18,358	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.45	3.19	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	27,233	25,833	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.71	14.79	<b>dry lb</b>
<b>MC wet (%)</b>	16.09		
<b>MC dry (%)</b>	19.32		
<b>Particulate (g)</b>	8.19		
<b>CO (g)</b>	370		
<b>Test Duration (h)</b>	4.63		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.09	4.13
<b>g/kg Dry Fuel</b>	1.22	55.20
<b>g/h</b>	1.77	79.96
<b>g/min</b>	0.03	1.33
<b>lb/MM Btu Output</b>	0.21	9.60

<b>Air/Fuel Ratio (A/F)</b>	14.91
-----------------------------	-------

VERSION:

2.2

12/14/2009

## HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/21/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 10  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 14.40  
 Total Load Weight Range (lbs): 13.70 to 15.10  
 Core Load Weight Range (lbs): 6.50 to 9.40  
 Remainder Load Weight Range (lbs): 5.00 to 7.90  
 Core Load Piece Range (lbs): 2.20 to 3.60  
 Remainder Load Piece Range (lbs): 1.40 to 7.90  
 Max Allowable Kindling Weight (lbs): 2.89  
 Max Allowable Start-up Fuel Weight (lbs): 4.33

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	16.00	3.06	In Range	26.8	17.9	18.9	21.2	In Range	2.53	1.15	
2	15.83	2.87	In Range	22.0	18.4	18.1	19.5	In Range	2.40	1.09	
3	15.75	2.45	In Range	26.6	16.8	18.3	20.6	In Range	2.03	0.92	
Core Load Wt. (lbs)		8.38	In Range								

### REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight		
				1	2	3	Ave.		lbs	kg	
1	16.00	2.38	In Range	27.0	14.3	14.2	18.5	In Range	2.01	0.91	
2	16.00	3.67	In Range	28.1	16.2	14.9	19.7	In Range	3.06	1.39	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		6.05	In Range								

Total Load Weight (lbs): 14.43 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: 100% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 10.0  
 Total Load Average Moisture Content (%DB): 19.9 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.6  
 Total Test Load Weight (dry basis): 12.03 lbs 5.46 kg

### KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
2.84	In Range	10	10	10	10.0	In Range	2.58	1.17

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
4.19	In Range	24.6	18.8	19.9	21.1	In Range	3.46	1.57

### TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 1.4 to 2.9  
 Actual Residual Start-up Fuel Weight (lb): 1.97 In Range



## LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking # 135  
 Technician: AK  
 Date: 12/21/2022

Nominal Loading Density (lbs/ft<sup>3</sup>, wet basis): 12  
 Usable Firebox Volume (ft<sup>3</sup>): 1.44  
 Target Load Weight (lbs): 17.28  
 Total Load Weight Range (lbs): 16.42 to 18.14  
 Core Load Weight Range (lbs): 7.78 to 11.23  
 Remainder Load Weight Range (lbs): 6.05 to 9.50  
 Core Load Piece Range (lbs): 2.59 to 4.32  
 Remainder Load Piece Range (lbs): 1.73 to 5.18

### CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.00	3.62	In Range	23.9	21.4	15.6	20.3	In Range	3.01	1.37
2	16.00	3.50	In Range	22.0	17.3	16.0	18.4	In Range	2.96	1.34
3	16.25	3.54	In Range	22.8	19.8	17.0	19.9	In Range	2.95	1.34
Core Load Wt. (lbs)		10.66	In Range							

### REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	16.25	4.20	In Range	22.4	18.4	17.8	19.5	In Range	3.51	1.59
2	15.75	2.79	In Range	24.6	15.6	14.3	18.2	In Range	2.36	1.07
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		6.99	In Range							

Remainder Load Small/Large Piece Weight Ratio: 66% In Range ≤ 67%  
 Total Load Weight (lbs): 17.65 In Range  
 Core Load % of Total Weight: 60% In Range 45-65%  
 Remainder % of Total Weight: 40% In Range 35-55%  
 Total Load % of Target Weight: 102% In Range 95-105%  
 Actual Fuel Loading Density (lb/ft<sup>3</sup>): 12.3  
 Total Load Average Moisture Content (%DB): 19.3 In Range 19-25%  
 Total Load Average Moisture Content (%WB): 16.2  
 Total Test Load Weight (dry basis): 14.79 lbs 6.71 kg

### TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 1.8 to 3.5  
 Actual Charcoal Bed Wt. (lb): 2.79 In Range

### TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.00 Valid Test (≥90%)

Total Fuel Burned During Test Run:  
 17.7 lbs, wet basis  
 14.8 lbs, dry basis  
 6.71 kg, dry basis

## DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6  
 Test Start Time: 12:13  
 Test Type: Medium Fire

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Recording Interval (min): 1  
 Total Sampling Time (min): 278

Meter Box  $\gamma$  Factor: 1.023 (A)  
 Meter Box  $\gamma$  Factor: 1.019 (B)  
 Meter Box  $\gamma$  Factor: 0.999 (C)  
 Meter Box  $\gamma$  Factor: 1.010 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100  
 Date Flue Pipe Last Cleaned: 12/16/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.82	29.81	29.82
Relative Humidity (%)	25.7	20.1	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	60.774 ft <sup>3</sup>		

### Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	5	in. Hg
(B)	0.000	cfm @	5	in. Hg
(C)	0.000	cfm @	5	in. Hg
(Ambient)	0.000	cfm @	6	in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.111	70
2	0.134	70
3	0.133	70
4	0.118	70
5	0.094	70
6	0.128	70
7	0.135	70
8	0.119	70
Center	0.137	70

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 8 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: 0.3491 ft<sup>2</sup>

V<sub>strav</sub>: 23.16 ft/sec  
 V<sub>scnt</sub>: 24.63 ft/sec  
 F<sub>p</sub>: 0.940 [ratio]

Initial Tunnel Flow: 471.5 scf/min

Static Pressure: -0.284 in. H<sub>2</sub>O

## 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
X	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

# WOODSTOVE PREBURN DATA

Client: SBI  
Model: 1.7R  
Run #: 6

Job #: 22-835  
Tracking #: 135  
Technician: AK  
Date: 12/21/2022

**Medium Fire Performed as a continuation of High Fire Test, see Run 5 test data for details**

Data from 12/2022 testing - Reference only

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.130	0.00	71.2	-0.47		17.65		109.7	425.8	85.7	77.6
1			0.126	0.00	72.0	0.19	-	17.63	-0.02	114.2	373.6	86.8	77.9
2			0.128	0.00	72.1	0.18	-	17.48	-0.14	116.2	364.2	85.8	78.2
3			0.127	0.00	72.1	0.20	-	17.28	-0.21	121.3	406.5	85.9	80.9
4			0.129	0.00	72.1	0.19	-	16.99	-0.29	113.0	477.4	85.6	82.5
5			0.130	0.00	72.1	0.20	-	16.77	-0.24	108.0	512.9	85.0	81.9
6			0.131	0.00	72.1	0.20	-	16.58	-0.19	107.3	534.0	84.3	82.2
7			0.130	0.00	72.2	0.21	-	16.41	-0.17	105.8	531.5	84.1	82.4
8			0.129	0.00	72.2	0.19	-	16.24	-0.17	105.4	531.5	84.2	81.6
9			0.128	0.00	72.2	0.19	-	16.10	-0.15	105.3	536.1	84.5	81.1
10	1.718	0.172	0.129	0.00	72.2	0.18	103	15.94	-0.15	104.0	537.0	84.5	81.8
11			0.130	0.00	72.2	0.18	-	15.78	-0.16	101.3	540.4	84.5	83.5
12			0.131	0.00	72.2	0.20	-	15.62	-0.16	101.2	547.9	84.5	84.0
13			0.132	0.00	72.1	0.20	-	15.44	-0.17	100.3	548.1	84.6	85.3
14			0.129	0.00	72.2	0.20	-	15.27	-0.17	100.3	546.0	84.7	85.5
15			0.128	0.00	72.2	0.19	-	15.10	-0.17	100.2	545.9	84.9	86.4
16			0.132	0.00	72.2	0.20	-	14.93	-0.17	100.2	549.6	85.1	86.7
17			0.132	0.00	72.2	0.19	-	14.81	-0.12	100.5	549.0	84.8	87.1
18			0.131	0.00	72.2	0.20	-	14.64	-0.17	100.5	549.0	84.9	87.2
19			0.131	0.00	72.2	0.19	-	14.44	-0.20	103.8	550.8	84.8	87.4
20	3.407	0.169	0.132	0.00	72.2	0.19	101	14.28	-0.16	107.1	554.8	85.0	85.5
21			0.130	0.00	72.2	0.18	-	14.10	-0.18	108.6	560.3	85.2	82.4
22			0.131	0.00	72.2	0.18	-	13.97	-0.14	106.6	564.8	85.1	82.1
23			0.129	0.00	72.2	0.18	-	13.77	-0.19	105.0	567.1	84.9	80.4
24			0.129	0.00	72.2	0.18	-	13.59	-0.18	104.6	569.4	85.0	79.1
25			0.130	0.00	72.2	0.18	-	13.38	-0.21	104.3	574.9	85.0	77.3
26			0.131	0.00	72.3	0.18	-	13.18	-0.20	104.4	585.4	85.0	77.1
27			0.132	0.00	72.2	0.18	-	12.97	-0.22	104.7	595.7	85.0	76.9
28			0.130	0.00	72.2	0.19	-	12.74	-0.23	105.2	606.3	85.2	75.6
29			0.132	0.00	72.2	0.19	-	12.49	-0.25	105.6	620.2	85.0	74.1
30	5.099	0.169	0.131	0.00	72.1	0.20	101	12.29	-0.21	106.2	633.8	85.2	74.7
31			0.129	0.00	72.2	0.20	-	12.04	-0.25	106.8	639.3	85.2	74.2
32			0.129	0.00	72.1	0.23	-	11.80	-0.24	107.1	644.1	85.3	73.9

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33			0.128	0.00	72.1	0.24	-	11.57	-0.23	107.3	643.4	85.4	73.4
34			0.130	0.00	72.1	0.26	-	11.35	-0.22	107.6	643.9	85.3	73.1
35			0.130	0.00	72.2	0.27	-	11.11	-0.25	107.6	646.9	85.5	73.4
36			0.129	0.00	72.2	0.29	-	10.90	-0.21	107.8	647.9	85.4	73.4
37			0.126	0.00	72.1	0.30	-	10.66	-0.23	108.0	648.7	85.5	72.9
38			0.129	0.00	72.1	0.33	-	10.44	-0.22	107.9	648.1	85.9	73.1
39			0.127	0.00	72.1	0.33	-	10.21	-0.23	108.2	646.9	86.1	73.1
40	6.794	0.169	0.129	0.00	72.1	0.34	102	9.98	-0.23	108.1	646.7	86.0	73.0
41			0.128	0.00	72.1	0.35	-	9.77	-0.21	108.0	645.5	86.0	72.7
42			0.127	0.00	72.1	0.35	-	9.52	-0.24	108.0	646.5	86.1	72.6
43			0.128	0.00	72.1	0.35	-	9.30	-0.23	108.0	647.6	86.0	72.7
44			0.128	0.00	72.0	0.35	-	9.08	-0.22	108.3	647.7	86.0	72.5
45			0.128	0.00	72.1	0.38	-	8.87	-0.21	108.3	647.9	86.0	72.8
46			0.130	0.00	72.0	0.38	-	8.63	-0.24	108.4	650.6	86.1	72.3
47			0.128	0.00	72.0	0.39	-	8.41	-0.22	108.4	652.6	86.1	72.7
48			0.127	0.00	72.0	0.39	-	8.18	-0.23	108.3	650.7	85.8	72.7
49			0.129	0.00	72.0	0.40	-	7.96	-0.22	108.4	653.5	85.8	72.7
50	8.470	0.168	0.128	0.00	72.0	0.42	101	7.74	-0.22	108.9	655.2	85.7	72.5
51			0.126	0.00	72.0	0.43	-	7.50	-0.24	109.0	655.9	85.6	72.5
52			0.129	0.00	71.9	0.44	-	7.28	-0.22	109.1	657.2	85.7	72.9
53			0.127	0.00	71.9	0.44	-	7.05	-0.23	109.3	658.2	85.6	73.0
54			0.129	0.00	71.8	0.45	-	6.84	-0.21	109.3	658.9	85.5	72.7
55			0.128	0.00	71.8	0.45	-	6.63	-0.21	108.9	660.2	85.2	72.3
56			0.130	0.00	71.8	0.46	-	6.40	-0.23	109.0	663.2	85.3	72.8
57			0.128	0.00	71.8	0.48	-	6.17	-0.22	109.0	665.7	85.4	72.5
58			0.127	0.00	71.8	0.47	-	6.00	-0.18	108.9	664.9	85.3	73.1
59			0.128	0.00	71.8	0.49	-	5.80	-0.20	108.8	663.3	85.1	73.0
60	10.146	0.168	0.130	0.00	71.9	0.49	101	5.61	-0.19	108.7	661.3	85.1	73.5
61			0.128	0.00	71.9	0.52	-	5.42	-0.19	108.4	656.5	85.2	73.2
62			0.130	0.00	71.9	0.51	-	5.23	-0.19	108.2	651.7	85.3	73.5
63			0.131	0.00	71.9	0.51	-	5.06	-0.17	107.9	644.5	85.2	73.7
64			0.127	0.00	72.0	0.52	-	4.88	-0.17	107.3	637.2	85.0	73.6
65			0.130	0.00	72.0	0.52	-	4.74	-0.15	106.8	626.8	85.1	73.7

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66			0.131	0.00	72.1	0.53	-	4.60	-0.13	106.2	615.7	85.2	73.7
67			0.133	0.00	72.1	0.53	-	4.45	-0.15	105.1	605.8	85.2	73.0
68			0.130	0.00	72.2	0.53	-	4.34	-0.11	104.6	595.3	85.2	73.7
69			0.133	0.00	72.2	0.53	-	4.22	-0.12	103.9	585.6	85.2	73.8
70	11.824	0.168	0.131	0.00	72.2	0.54	100	4.10	-0.12	103.4	577.1	85.1	73.4
71			0.129	0.00	72.1	0.55	-	3.99	-0.10	102.9	569.6	85.1	73.2
72			0.133	0.00	72.0	0.55	-	3.90	-0.09	101.9	560.9	84.8	73.2
73			0.132	0.00	72.0	0.55	-	3.79	-0.11	101.1	549.5	84.6	75.2
74			0.133	0.00	72.1	0.54	-	3.73	-0.06	100.8	539.2	84.7	76.4
75			0.131	0.00	72.0	0.53	-	3.67	-0.06	100.7	531.6	84.6	77.1
76			0.131	0.00	72.0	0.55	-	3.62	-0.05	100.0	523.9	84.4	77.5
77			0.133	0.00	72.0	0.55	-	3.58	-0.04	99.5	516.5	84.5	77.8
78			0.130	0.00	72.0	0.55	-	3.54	-0.04	99.1	509.6	84.6	77.7
79			0.132	0.00	72.0	0.55	-	3.51	-0.04	98.8	503.1	84.5	77.6
80	13.512	0.169	0.132	0.00	71.9	0.53	100	3.46	-0.05	98.4	497.8	84.7	78.2
81			0.132	0.00	71.9	0.53	-	3.42	-0.04	97.9	491.7	84.5	78.9
82			0.133	0.00	71.9	0.54	-	3.38	-0.04	97.5	486.8	84.5	78.6
83			0.132	0.00	71.8	0.54	-	3.35	-0.03	97.0	482.3	84.6	79.4
84			0.133	0.00	71.8	0.54	-	3.31	-0.04	96.8	476.9	84.5	79.6
85			0.134	0.00	71.8	0.55	-	3.29	-0.01	96.4	472.0	84.4	79.8
86			0.133	0.00	71.8	0.55	-	3.24	-0.05	96.1	467.3	84.4	79.1
87			0.134	0.00	71.8	0.54	-	3.21	-0.04	95.8	462.5	84.4	79.4
88			0.134	0.00	71.9	0.54	-	3.17	-0.04	95.4	457.7	84.2	80.0
89			0.133	0.00	71.9	0.54	-	3.12	-0.05	95.1	451.6	84.2	79.6
90	15.209	0.170	0.132	0.00	71.9	0.55	100	3.09	-0.03	94.6	445.4	84.4	78.9
91			0.131	0.00	72.0	0.54	-	3.05	-0.03	94.3	439.1	84.4	79.2
92			0.132	0.00	71.9	0.55	-	3.01	-0.04	93.9	432.2	84.3	79.0
93			0.132	0.00	72.0	0.55	-	3.00	-0.02	93.3	425.8	84.4	79.8
94			0.134	0.00	72.0	0.55	-	2.96	-0.04	92.9	418.7	84.4	79.8
95			0.135	0.00	71.9	0.54	-	2.94	-0.02	93.2	411.4	84.1	79.9
96			0.135	0.00	71.9	0.55	-	2.89	-0.05	94.2	405.3	84.1	81.4
97			0.134	0.00	71.9	0.53	-	2.83	-0.06	94.7	398.6	84.2	82.1
98			0.134	0.00	71.9	0.55	-	2.79	-0.04	95.0	394.3	84.1	82.3

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99			0.134	0.00	72.0	0.54	-	2.76	-0.03	95.0	390.0	84.2	82.6
100	16.911	0.170	0.134	0.00	72.0	0.54	100	2.73	-0.03	95.1	386.2	84.2	82.7
101			0.134	0.00	72.1	0.55	-	2.68	-0.05	95.0	382.0	84.1	82.9
102			0.135	0.00	72.1	0.54	-	2.66	-0.02	94.9	375.5	84.0	82.8
103			0.134	0.00	72.2	0.56	-	2.63	-0.03	94.8	369.8	83.8	82.9
104			0.135	0.00	72.1	0.55	-	2.59	-0.04	94.5	365.9	83.9	83.1
105			0.134	0.00	72.2	0.56	-	2.57	-0.02	94.4	361.5	83.8	83.2
106			0.135	0.00	72.2	0.56	-	2.54	-0.03	94.2	358.1	83.7	83.0
107			0.134	0.00	72.2	0.56	-	2.51	-0.03	94.1	354.6	83.7	83.1
108			0.134	0.00	72.3	0.55	-	2.49	-0.03	93.8	351.5	83.5	83.7
109			0.133	0.00	72.2	0.55	-	2.46	-0.03	93.7	349.2	83.6	83.4
110	18.619	0.171	0.133	0.00	72.2	0.56	100	2.44	-0.03	93.6	346.7	83.5	83.5
111			0.133	0.00	72.1	0.56	-	2.41	-0.03	93.4	344.5	83.3	83.9
112			0.135	0.00	72.1	0.54	-	2.39	-0.02	93.2	342.6	83.3	83.4
113			0.135	0.00	72.1	0.55	-	2.38	-0.01	93.1	340.5	83.2	83.6
114			0.135	0.00	72.0	0.55	-	2.35	-0.03	93.0	338.5	83.4	83.4
115			0.134	0.00	72.0	0.55	-	2.34	-0.01	92.8	337.1	83.1	83.2
116			0.134	0.00	72.0	0.55	-	2.32	-0.01	92.6	335.8	83.1	83.2
117			0.134	0.00	72.1	0.54	-	2.30	-0.03	92.4	334.1	83.2	83.8
118			0.135	0.00	72.0	0.55	-	2.28	-0.01	92.3	331.9	83.0	83.5
119			0.134	0.00	72.1	0.55	-	2.26	-0.02	92.1	330.4	82.9	83.4
120	20.342	0.172	0.134	0.00	72.0	0.55	101	2.25	-0.01	92.0	328.8	83.1	83.5
121			0.135	0.00	72.0	0.56	-	2.23	-0.03	91.9	327.3	83.0	83.2
122			0.134	0.00	71.9	0.55	-	2.22	0.00	91.8	325.4	82.8	83.3
123			0.133	0.00	71.9	0.56	-	2.20	-0.02	91.6	324.3	82.8	83.4
124			0.135	0.00	71.8	0.56	-	2.19	-0.01	91.5	322.6	82.9	82.8
125			0.135	0.00	71.8	0.54	-	2.18	-0.01	91.3	320.7	82.8	82.9
126			0.133	0.00	71.8	0.55	-	2.17	-0.02	91.3	320.0	82.8	83.3
127			0.134	0.00	71.8	0.54	-	2.15	-0.02	91.2	318.7	82.9	83.8
128			0.135	0.00	71.8	0.55	-	2.14	0.00	91.1	317.3	82.9	83.3
129			0.134	0.00	71.8	0.55	-	2.12	-0.02	90.9	316.2	82.7	83.3
130	22.063	0.172	0.134	0.00	71.9	0.55	100	2.11	-0.01	90.9	314.6	82.8	83.3
131			0.134	0.00	71.9	0.55	-	2.10	-0.02	90.7	313.0	82.6	82.9

# BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132			0.134	0.00	71.9	0.54	-	2.09	-0.01	90.4	311.4	82.8	83.1
133			0.134	0.00	71.8	0.56	-	2.07	-0.02	90.5	310.0	82.8	83.4
134			0.134	0.00	71.8	0.55	-	2.05	-0.02	90.1	308.8	82.8	83.6
135			0.136	0.00	71.8	0.56	-	2.04	0.00	89.4	307.6	82.7	83.7
136			0.134	0.00	71.7	0.55	-	2.02	-0.02	89.1	306.2	82.6	84.3
137			0.135	0.00	71.7	0.54	-	2.00	-0.02	89.1	305.6	82.7	84.0
138			0.134	0.00	71.6	0.55	-	1.98	-0.02	89.0	304.4	82.7	84.3
139			0.135	0.00	71.6	0.54	-	1.96	-0.02	89.0	303.8	82.6	84.6
140	23.799	0.174	0.133	0.00	71.7	0.55	101	1.94	-0.02	89.1	302.7	82.6	84.6
141			0.134	0.00	71.7	0.55	-	1.92	-0.02	88.9	302.4	82.5	84.7
142			0.135	0.00	71.6	0.55	-	1.91	-0.02	88.7	301.2	82.5	85.0
143			0.136	0.00	71.6	0.56	-	1.89	-0.02	88.8	300.8	82.5	85.0
144			0.133	0.00	71.7	0.54	-	1.86	-0.03	88.7	300.0	82.5	85.2
145			0.134	0.00	71.6	0.55	-	1.86	0.00	88.7	299.4	82.3	85.2
146			0.135	0.00	71.6	0.54	-	1.84	-0.02	88.6	298.6	82.5	85.3
147			0.134	0.00	71.6	0.54	-	1.81	-0.03	88.6	297.9	82.4	85.5
148			0.133	0.00	71.6	0.55	-	1.80	-0.02	88.5	297.2	82.4	85.0
149			0.134	0.00	71.6	0.55	-	1.78	-0.01	88.4	296.4	82.4	85.5
150	25.524	0.173	0.134	0.00	71.6	0.56	101	1.76	-0.02	88.4	296.1	82.4	85.5
151			0.133	0.00	71.6	0.55	-	1.74	-0.02	88.4	295.6	82.5	85.1
152			0.135	0.00	71.7	0.55	-	1.73	-0.01	88.3	295.6	82.6	85.8
153			0.135	0.00	71.7	0.57	-	1.71	-0.02	88.2	295.2	82.5	85.6
154			0.136	0.00	71.6	0.55	-	1.70	-0.01	88.1	294.6	82.4	85.6
155			0.134	0.00	71.7	0.56	-	1.67	-0.03	88.1	294.6	82.3	85.6
156			0.135	0.00	71.6	0.55	-	1.65	-0.02	88.0	293.8	82.2	85.0
157			0.135	0.00	71.6	0.56	-	1.63	-0.02	87.9	293.5	82.2	85.0
158			0.133	0.00	71.5	0.56	-	1.63	-0.01	88.0	293.6	82.4	86.1
159			0.133	0.00	71.6	0.56	-	1.62	-0.01	88.0	293.0	82.4	86.0
160	27.262	0.174	0.133	0.00	71.6	0.56	101	1.60	-0.02	88.0	292.4	82.5	85.9
161			0.133	0.00	71.7	0.56	-	1.57	-0.03	87.9	292.4	82.4	85.6
162			0.135	0.00	71.7	0.56	-	1.56	-0.02	87.7	291.4	82.6	85.5
163			0.134	0.00	71.7	0.56	-	1.55	-0.01	87.7	290.8	82.7	85.5
164			0.135	0.00	71.8	0.56	-	1.53	-0.01	87.7	290.6	82.6	85.1



## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165			0.133	0.00	71.7	0.54	-	1.51	-0.03	87.7	290.2	82.6	85.3
166			0.135	0.00	71.6	0.55	-	1.49	-0.02	87.6	289.4	82.5	85.7
167			0.136	0.00	71.6	0.55	-	1.49	0.00	87.6	289.3	82.5	85.3
168			0.137	0.00	71.5	0.55	-	1.48	-0.01	87.5	288.7	82.5	85.5
169			0.136	0.00	71.5	0.56	-	1.45	-0.02	87.4	288.3	82.4	85.4
170	28.994	0.173	0.136	0.00	71.5	0.56	100	1.44	-0.01	87.4	287.6	82.4	85.1
171			0.136	0.00	71.5	0.56	-	1.43	-0.01	87.3	287.3	82.5	85.4
172			0.135	0.00	71.5	0.56	-	1.41	-0.02	87.3	286.4	82.4	85.4
173			0.135	0.00	71.5	0.57	-	1.40	-0.01	87.2	285.8	82.5	85.1
174			0.137	0.00	71.5	0.55	-	1.38	-0.02	87.1	285.2	82.5	85.1
175			0.136	0.00	71.5	0.56	-	1.37	-0.01	87.0	284.6	82.4	85.3
176			0.136	0.00	71.4	0.55	-	1.35	-0.02	87.0	284.3	82.4	85.6
177			0.136	0.00	71.4	0.56	-	1.34	-0.02	87.0	284.1	82.3	85.5
178			0.135	0.00	71.4	0.56	-	1.32	-0.02	87.0	284.1	82.2	85.2
179			0.135	0.00	71.4	0.55	-	1.31	-0.01	87.0	283.9	82.2	85.3
180	30.729	0.174	0.133	0.00	71.5	0.55	101	1.28	-0.02	87.0	283.4	82.3	85.5
181			0.135	0.00	71.5	0.57	-	1.27	-0.01	87.0	283.5	82.2	85.2
182			0.135	0.00	71.5	0.56	-	1.26	-0.01	86.9	283.4	82.2	84.5
183			0.134	0.00	71.4	0.57	-	1.25	-0.01	86.9	283.6	82.1	84.8
184			0.135	0.00	71.4	0.56	-	1.22	-0.03	86.8	283.3	82.2	85.2
185			0.135	0.00	71.4	0.57	-	1.21	-0.01	86.7	282.8	82.2	85.3
186			0.135	0.00	71.3	0.56	-	1.20	-0.01	86.8	282.5	82.2	85.2
187			0.136	0.00	71.3	0.56	-	1.19	-0.01	86.9	282.3	82.2	84.9
188			0.135	0.00	71.3	0.55	-	1.18	-0.01	86.7	282.4	82.1	85.0
189			0.136	0.00	71.3	0.54	-	1.16	-0.02	86.7	282.2	81.9	85.0
190	32.467	0.174	0.135	0.00	71.4	0.55	101	1.14	-0.02	86.6	282.2	82.2	85.3
191			0.133	0.00	71.4	0.55	-	1.12	-0.02	86.6	281.9	83.1	85.1
192			0.134	0.00	71.5	0.55	-	1.11	-0.01	86.7	281.9	84.3	85.3
193			0.135	0.00	71.5	0.56	-	1.09	-0.02	86.6	281.7	85.1	84.7
194			0.135	0.00	71.5	0.56	-	1.08	-0.02	86.6	281.5	85.9	85.0
195			0.133	0.00	71.5	0.56	-	1.06	-0.01	86.5	281.3	86.4	84.9
196			0.136	0.00	71.5	0.57	-	1.04	-0.02	86.5	281.1	86.9	85.3
197			0.135	0.00	71.4	0.57	-	1.03	-0.01	86.5	281.4	87.4	85.0

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198			0.135	0.00	71.5	0.57	-	1.01	-0.02	86.4	281.4	87.9	85.0
199			0.135	0.00	71.5	0.56	-	0.99	-0.02	86.4	281.2	88.3	85.0
200	34.189	0.172	0.135	0.00	71.5	0.56	99	0.98	-0.01	86.4	281.2	87.9	85.0
201			0.134	0.00	71.6	0.56	-	0.96	-0.02	86.4	280.9	87.1	85.0
202			0.136	0.00	71.6	0.57	-	0.94	-0.02	86.4	280.8	86.4	85.3
203			0.136	0.00	71.6	0.57	-	0.94	-0.02	86.3	280.4	85.8	85.2
204			0.136	0.00	71.5	0.56	-	0.92	-0.02	86.3	280.2	85.2	85.2
205			0.135	0.00	71.5	0.56	-	0.91	-0.01	86.2	280.4	84.7	85.2
206			0.135	0.00	71.5	0.56	-	0.89	-0.02	86.3	280.0	84.3	84.5
207			0.136	0.00	71.5	0.57	-	0.88	-0.01	86.2	279.9	83.9	85.1
208			0.136	0.00	71.5	0.56	-	0.86	-0.02	86.1	279.4	83.5	84.8
209			0.134	0.00	71.6	0.58	-	0.85	-0.01	86.1	279.3	83.2	85.0
210	35.914	0.172	0.133	0.00	71.6	0.56	100	0.82	-0.03	86.1	279.1	82.6	84.9
211			0.135	0.00	71.6	0.57	-	0.81	-0.01	86.1	278.3	82.4	84.8
212			0.135	0.00	71.5	0.57	-	0.80	-0.01	85.9	276.2	81.9	84.6
213			0.135	0.00	71.5	0.56	-	0.79	-0.01	85.8	274.6	81.8	85.0
214			0.136	0.00	71.6	0.58	-	0.78	-0.01	85.7	273.3	81.5	85.0
215			0.135	0.00	71.5	0.55	-	0.76	-0.02	85.8	272.2	81.2	85.0
216			0.137	0.00	71.6	0.56	-	0.75	-0.01	85.6	271.2	80.9	84.5
217			0.135	0.00	71.5	0.57	-	0.73	-0.02	85.6	270.6	81.4	84.8
218			0.135	0.00	71.5	0.57	-	0.72	-0.01	85.5	269.6	82.3	84.6
219			0.135	0.00	71.6	0.56	-	0.71	-0.01	85.5	268.6	83.2	84.7
220	37.657	0.174	0.134	0.00	71.6	0.57	101	0.69	-0.02	85.4	267.9	84.1	84.7
221			0.135	0.00	71.7	0.57	-	0.68	-0.01	85.3	266.8	84.8	84.8
222			0.135	0.00	71.8	0.56	-	0.67	-0.01	85.4	266.5	85.4	85.1
223			0.137	0.00	71.8	0.56	-	0.66	-0.02	85.3	266.1	86.0	85.2
224			0.136	0.00	71.8	0.56	-	0.64	-0.02	85.2	265.6	86.6	84.7
225			0.136	0.00	71.8	0.57	-	0.62	-0.01	85.2	265.3	87.0	84.8
226			0.136	0.00	71.8	0.57	-	0.61	-0.01	85.1	265.0	87.0	84.8
227			0.137	0.00	71.7	0.57	-	0.60	-0.02	85.0	264.7	86.9	85.1
228			0.136	0.00	71.8	0.57	-	0.59	-0.01	85.1	264.2	86.5	84.7
229			0.136	0.00	71.7	0.57	-	0.58	-0.01	85.1	263.9	86.4	84.6
230	39.393	0.174	0.137	0.00	71.7	0.57	100	0.56	-0.02	84.6	263.4	86.1	85.0

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231			0.136	0.00	71.7	0.56	-	0.54	-0.01	84.5	263.2	85.9	85.0
232			0.136	0.00	71.7	0.57	-	0.53	-0.02	84.4	262.7	85.7	85.5
233			0.136	0.00	71.7	0.57	-	0.52	-0.01	84.2	262.0	85.4	85.2
234			0.137	0.00	71.7	0.56	-	0.50	-0.01	84.3	261.8	85.5	85.2
235			0.137	0.00	71.7	0.57	-	0.49	-0.01	84.2	261.7	85.3	85.3
236			0.136	0.00	71.7	0.55	-	0.47	-0.02	84.2	260.7	85.1	84.9
237			0.136	0.00	71.7	0.56	-	0.47	-0.01	84.1	260.4	85.3	85.2
238			0.136	0.00	71.6	0.57	-	0.45	-0.02	84.1	259.7	85.0	85.1
239			0.134	0.00	71.7	0.56	-	0.44	-0.01	84.0	259.1	85.0	84.9
240	41.126	0.173	0.135	0.00	71.6	0.57	99	0.42	-0.02	84.1	258.4	85.0	85.2
241			0.135	0.00	71.7	0.56	-	0.40	-0.01	84.0	257.6	85.2	84.8
242			0.135	0.00	71.7	0.58	-	0.40	0.00	84.0	256.6	85.1	85.2
243			0.136	0.00	71.7	0.56	-	0.39	-0.01	84.0	256.2	85.0	85.0
244			0.138	0.00	71.6	0.58	-	0.37	-0.01	83.8	255.7	84.9	85.2
245			0.136	0.00	71.6	0.57	-	0.36	-0.01	83.8	254.9	84.9	84.9
246			0.136	0.00	71.6	0.58	-	0.35	-0.01	83.7	254.0	85.0	85.2
247			0.136	0.00	71.6	0.56	-	0.34	-0.01	83.7	253.3	84.9	85.0
248			0.137	0.00	71.6	0.57	-	0.33	-0.02	83.6	252.5	84.8	85.1
249			0.137	0.00	71.5	0.56	-	0.31	-0.01	83.7	251.7	84.7	85.0
250	42.855	0.173	0.136	0.00	71.5	0.57	99	0.29	-0.02	83.6	250.8	84.6	84.6
251			0.136	0.00	71.6	0.57	-	0.29	-0.01	83.6	250.3	84.7	84.9
252			0.137	0.00	71.5	0.58	-	0.27	-0.01	83.4	249.7	84.4	84.8
253			0.136	0.00	71.5	0.58	-	0.25	-0.02	83.5	249.0	84.3	84.7
254			0.135	0.00	71.5	0.56	-	0.25	0.00	83.4	248.5	84.3	85.0
255			0.136	0.00	71.4	0.58	-	0.24	-0.01	83.3	247.8	84.3	85.1
256			0.134	0.00	71.4	0.58	-	0.23	-0.01	83.3	246.8	84.2	85.0
257			0.136	0.00	71.4	0.57	-	0.22	-0.02	83.2	246.4	84.4	84.8
258			0.138	0.00	71.4	0.57	-	0.22	0.00	83.1	246.0	84.3	84.7
259			0.136	0.00	71.4	0.58	-	0.19	-0.02	83.1	245.5	84.3	84.7
260	44.592	0.174	0.137	0.00	71.3	0.57	100	0.19	-0.01	83.1	245.1	84.2	84.8
261			0.135	0.00	71.4	0.57	-	0.17	-0.02	83.0	244.7	84.2	84.4
262			0.137	0.00	71.4	0.56	-	0.17	0.00	83.0	244.3	84.1	84.7
263			0.136	0.00	71.4	0.57	-	0.16	-0.01	82.9	243.8	84.1	84.6

## BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264			0.137	0.00	71.4	0.56	-	0.13	-0.02	82.9	243.2	84.0	84.5
265			0.136	0.00	71.3	0.58	-	0.13	-0.01	82.9	242.6	84.0	84.0
266			0.136	0.00	71.3	0.57	-	0.10	-0.02	82.8	241.7	84.2	84.4
267			0.134	0.00	71.3	0.56	-	0.10	0.00	82.7	241.2	84.0	84.6
268			0.136	0.00	71.3	0.58	-	0.09	-0.02	82.7	240.3	84.1	84.4
269			0.135	0.00	71.3	0.57	-	0.09	0.00	82.7	239.5	83.9	84.2
270	46.317	0.173	0.136	0.00	71.3	0.57	99	0.07	-0.02	82.6	238.8	83.9	84.1
271			0.136	0.00	71.4	0.57	-	0.06	-0.01	82.4	238.0	83.9	84.4
272			0.134	0.00	71.4	0.57	-	0.04	-0.02	82.5	237.2	83.8	84.3
273			0.135	0.00	71.4	0.57	-	0.05	0.00	82.4	236.5	83.7	84.3
274			0.136	0.00	71.4	0.57	-	0.03	-0.01	82.3	235.9	83.7	84.1
275			0.136	0.00	71.5	0.57	-	0.02	-0.01	82.3	235.3	83.9	84.5
276			0.136	0.00	71.5	0.56	-	0.01	-0.02	82.3	234.5	83.6	84.2
277			0.137	0.00	71.4	0.57	-	0.01	0.00	82.2	234.1	83.8	84.2
278	47.537	0.174	0.137	0.00	71.4	0.57	100	0.00	-0.01	82.2	234.1	83.8	84.2
Avg/Tot	47.537	0.172	0.133	0.00	71.8	0.49	100			93.2	384.0	84.2	82.0

Data from 12/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
0	0.000		0.00	70.6	-0.27		85.6	-0.079	2.52	0.144	9.9	44.8
1			0.00	71.1	0.39	-	88.2	-0.071	1.89	0.077	12.3	49.1
2			0.00	71.2	0.49	-	86.3	-0.081	2.16	0.156	14.2	54.1
3			0.00	71.2	0.48	-	86.5	-0.095	3.19	0.164	14.7	58.6
4			0.00	71.2	0.45	-	87.0	-0.095	9.06	0.209	16.7	57.2
5			0.00	71.2	0.47	-	86.6	-0.096	12.59	0.191	19.6	57.2
6			0.00	71.3	0.47	-	86.2	-0.099	12.60	0.178	19.9	57.2
7			0.00	71.3	0.40	-	85.9	-0.096	12.39	0.175	19.8	55.9
8			0.00	71.4	0.49	-	85.6	-0.096	11.31	0.226	19.8	55.2
9			0.00	71.4	0.48	-	85.2	-0.098	11.62	0.185	19.8	55.2
10	1.719	0.172	0.00	71.4	0.49	106	84.9	-0.097	11.35	0.186	19.8	54.7
11			0.00	71.4	0.45	-	84.5	-0.098	11.63	0.171	21.1	53.8
12			0.00	71.4	0.50	-	84.0	-0.100	11.98	0.166	21.5	54.0
13			0.00	71.3	0.39	-	83.7	-0.099	12.80	0.230	21.9	54.0
14			0.00	71.3	0.49	-	83.4	-0.100	12.33	0.198	22.0	54.0
15			0.00	71.4	0.50	-	83.3	-0.099	12.12	0.231	22.0	53.8
16			0.00	71.4	0.43	-	83.1	-0.100	12.47	0.240	22.2	54.1
17			0.00	71.4	0.43	-	82.8	-0.099	13.02	0.291	22.4	54.3
18			0.00	71.4	0.49	-	82.7	-0.099	12.93	0.189	22.2	54.3
19			0.00	71.4	0.49	-	82.7	-0.100	13.28	0.198	21.6	55.8
20	3.416	0.170	0.00	71.4	0.43	104	83.0	-0.100	13.77	0.253	20.3	56.8
21			0.00	71.4	0.47	-	83.1	-0.100	14.24	0.276	19.7	57.2
22			0.00	71.4	0.50	-	83.0	-0.099	14.28	0.336	20.2	56.8
23			0.00	71.4	0.41	-	82.6	-0.101	14.41	0.270	20.7	56.1
24			0.00	71.4	0.48	-	82.6	-0.100	14.46	0.322	21.0	56.1
25			0.00	71.4	0.43	-	82.5	-0.102	14.82	0.371	21.2	56.1
26			0.00	71.5	0.46	-	82.4	-0.103	15.32	0.575	21.4	56.5
27			0.00	71.5	0.45	-	82.3	-0.105	15.79	0.628	21.4	56.8
28			0.00	71.5	0.46	-	82.4	-0.104	16.06	0.764	21.5	57.0
29			0.00	71.5	0.42	-	82.3	-0.107	16.52	0.779	21.4	57.6
30	5.116	0.170	0.00	71.4	0.49	104	82.3	-0.107	17.04	0.951	21.4	57.9
31			0.00	71.5	0.42	-	82.3	-0.107	16.84	1.055	21.2	58.1
32			0.00	71.4	0.53	-	82.4	-0.108	16.90	1.112	21.2	58.5
33			0.00	71.4	0.54	-	82.5	-0.108	16.72	1.206	21.1	58.5
34			0.00	71.4	0.54	-	82.4	-0.107	16.77	1.233	20.9	58.5
35			0.00	71.4	0.54	-	82.5	-0.107	16.83	1.253	20.9	58.3
36			0.00	71.4	0.53	-	82.4	-0.107	16.83	1.228	20.8	58.5
37			0.00	71.4	0.59	-	82.4	-0.108	16.88	1.164	20.7	58.5
38			0.00	71.3	0.62	-	82.4	-0.107	16.77	1.174	20.7	58.5

Data from 12/21/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
39			0.00	71.4	0.55	-	82.3	-0.108	16.80	1.120	20.6	58.5
40	6.809	0.169	0.00	71.4	0.64	104	82.3	-0.107	16.77	1.074	20.6	58.5
41			0.00	71.4	0.62	-	82.1	-0.107	16.71	1.164	20.5	58.3
42			0.00	71.4	0.57	-	82.3	-0.108	16.73	1.256	20.7	58.5
43			0.00	71.4	0.58	-	82.3	-0.108	16.80	1.263	20.6	58.3
44			0.00	71.4	0.59	-	82.3	-0.108	16.62	1.394	20.5	58.5
45			0.00	71.4	0.60	-	82.3	-0.108	16.68	1.430	20.4	58.3
46			0.00	71.3	0.65	-	82.5	-0.108	16.82	1.351	20.4	58.5
47			0.00	71.3	0.67	-	82.5	-0.108	16.80	1.375	20.4	58.5
48			0.00	71.3	0.67	-	82.5	-0.108	17.00	1.252	20.4	58.3
49			0.00	71.3	0.65	-	82.6	-0.109	17.19	1.306	20.4	58.5
50	8.486	0.168	0.00	71.3	0.67	104	82.6	-0.108	17.20	1.350	20.4	58.6
51			0.00	71.3	0.70	-	82.6	-0.108	17.45	1.601	20.4	58.8
52			0.00	71.3	0.71	-	82.7	-0.108	17.41	1.589	20.1	58.5
53			0.00	71.2	0.71	-	82.8	-0.108	17.36	1.533	20.1	58.6
54			0.00	71.3	0.70	-	82.9	-0.109	17.42	1.535	19.9	58.3
55			0.00	71.2	0.72	-	82.9	-0.109	17.52	1.380	19.8	58.1
56			0.00	71.2	0.71	-	82.9	-0.108	17.50	1.331	19.6	57.9
57			0.00	71.2	0.72	-	82.9	-0.108	17.67	1.220	19.5	57.7
58			0.00	71.2	0.73	-	82.9	-0.108	17.77	1.173	19.5	57.6
59			0.00	71.2	0.75	-	82.8	-0.108	17.63	1.114	19.3	57.4
60	10.165	0.168	0.00	71.3	0.74	104	82.8	-0.108	17.50	0.986	19.2	57.2
61			0.00	71.2	0.75	-	83.0	-0.107	17.44	0.829	19.1	56.7
62			0.00	71.3	0.79	-	82.9	-0.107	17.36	0.662	18.9	56.3
63			0.00	71.2	0.79	-	82.8	-0.106	17.01	0.722	18.9	55.9
64			0.00	71.3	0.75	-	82.7	-0.106	16.82	0.438	18.8	55.4
65			0.00	71.3	0.77	-	82.6	-0.103	15.63	0.411	18.4	54.3
66			0.00	71.3	0.76	-	82.6	-0.102	14.87	0.298	18.2	53.6
67			0.00	71.3	0.76	-	82.7	-0.102	14.66	0.226	18.3	53.1
68			0.00	71.4	0.81	-	82.6	-0.101	14.04	0.195	18.2	52.3
69			0.00	71.3	0.76	-	82.4	-0.100	13.69	0.108	18.0	51.6
70	11.841	0.168	0.00	71.4	0.76	103	82.4	-0.098	13.44	0.069	17.9	50.9
71			0.00	71.4	0.84	-	82.4	-0.097	13.03	0.038	17.7	50.4
72			0.00	71.4	0.79	-	82.4	-0.097	12.68	0.022	17.7	49.5
73			0.00	71.3	0.85	-	82.1	-0.095	11.99	0.000	17.7	48.7
74			0.00	71.3	0.77	-	81.9	-0.093	11.19	0.000	17.2	47.8
75			0.00	71.3	0.80	-	82.0	-0.093	11.04	0.000	17.1	47.5
76			0.00	71.3	0.82	-	82.0	-0.091	10.90	0.000	17.1	46.9
77			0.00	71.3	0.83	-	82.2	-0.091	10.45	0.000	16.9	46.4

Data from 12/21/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
78			0.00	71.3	0.83	-	82.4	-0.090	9.93	0.000	16.8	45.9
79			0.00	71.3	0.79	-	82.4	-0.090	9.83	0.000	16.7	45.5
80	13.544	0.170	0.00	71.3	0.85	103	82.6	-0.089	9.77	0.000	16.7	45.1
81			0.00	71.3	0.85	-	82.8	-0.088	9.66	0.000	16.7	44.8
82			0.00	71.2	0.84	-	82.9	-0.087	9.59	0.000	16.6	44.2
83			0.00	71.2	0.80	-	83.1	-0.087	9.53	0.000	16.6	43.9
84			0.00	71.2	0.86	-	83.2	-0.086	9.46	0.000	16.5	43.5
85			0.00	71.2	0.80	-	83.3	-0.086	9.37	0.000	16.5	43.2
86			0.00	71.2	0.84	-	83.4	-0.085	9.26	0.000	16.5	43.0
87			0.00	71.2	0.82	-	83.6	-0.085	9.15	0.014	16.5	42.6
88			0.00	71.3	0.83	-	83.6	-0.084	8.98	0.031	16.5	42.3
89			0.00	71.3	0.82	-	83.7	-0.082	8.50	0.024	16.5	42.1
90	15.253	0.171	0.00	71.3	0.86	103	83.7	-0.082	8.10	0.038	16.5	41.9
91			0.00	71.3	0.85	-	83.6	-0.081	7.81	0.104	16.4	41.5
92			0.00	71.3	0.78	-	83.4	-0.080	7.56	0.172	16.5	41.2
93			0.00	71.3	0.79	-	83.4	-0.080	7.29	0.291	16.7	41.0
94			0.00	71.3	0.85	-	83.4	-0.078	7.22	0.279	16.7	40.8
95			0.00	71.3	0.77	-	83.5	-0.078	7.09	0.348	16.7	40.8
96			0.00	71.4	0.82	-	83.7	-0.076	6.94	0.419	16.2	41.0
97			0.00	71.3	0.76	-	83.8	-0.075	6.81	0.446	16.0	40.8
98			0.00	71.4	0.84	-	83.9	-0.074	7.04	0.385	15.9	41.0
99			0.00	71.4	0.78	-	84.1	-0.075	6.63	0.506	15.8	40.8
100	16.955	0.170	0.00	71.4	0.78	102	84.3	-0.074	6.53	0.484	15.7	40.6
101			0.00	71.4	0.82	-	84.3	-0.074	6.51	0.460	15.6	40.5
102			0.00	71.5	0.83	-	84.4	-0.072	6.18	0.632	15.4	40.1
103			0.00	71.5	0.81	-	84.4	-0.072	6.14	0.685	15.5	40.1
104			0.00	71.5	0.82	-	84.4	-0.071	6.10	0.695	15.6	40.1
105			0.00	71.5	0.87	-	84.4	-0.071	6.09	0.719	15.6	40.1
106			0.00	71.5	0.81	-	84.3	-0.070	6.14	0.760	15.6	40.1
107			0.00	71.5	0.84	-	84.3	-0.069	6.15	0.789	15.7	39.9
108			0.00	71.6	0.82	-	84.4	-0.069	6.06	0.735	15.7	39.7
109			0.00	71.6	0.86	-	84.4	-0.069	6.04	0.685	15.6	39.6
110	18.677	0.172	0.00	71.6	0.81	103	84.5	-0.068	6.05	0.657	15.6	39.4
111			0.00	71.5	0.84	-	84.4	-0.068	6.18	0.596	15.7	39.4
112			0.00	71.5	0.84	-	84.5	-0.067	6.20	0.633	15.7	39.4
113			0.00	71.5	0.78	-	84.5	-0.068	6.24	0.632	15.7	39.2
114			0.00	71.5	0.85	-	84.6	-0.067	6.17	0.632	15.7	39.2
115			0.00	71.5	0.82	-	84.5	-0.067	6.23	0.605	15.7	39.0
116			0.00	71.5	0.79	-	84.5	-0.066	6.11	0.568	15.7	38.8

Data from 12/21/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
117			0.00	71.5	0.84	-	84.5	-0.066	6.07	0.577	15.7	38.7
118			0.00	71.5	0.78	-	84.6	-0.066	6.08	0.520	15.7	38.7
119			0.00	71.5	0.81	-	84.6	-0.066	6.04	0.502	15.7	38.5
120	20.394	0.172	0.00	71.5	0.84	103	84.6	-0.065	5.96	0.494	15.7	38.5
121			0.00	71.5	0.81	-	84.6	-0.065	5.93	0.480	15.8	38.5
122			0.00	71.5	0.79	-	84.5	-0.065	5.92	0.481	15.8	38.3
123			0.00	71.5	0.82	-	84.5	-0.065	5.81	0.482	15.8	38.3
124			0.00	71.4	0.79	-	84.5	-0.064	5.80	0.472	15.9	38.3
125			0.00	71.4	0.80	-	84.5	-0.065	5.81	0.472	15.9	38.1
126			0.00	71.4	0.82	-	84.6	-0.064	5.78	0.467	15.9	38.1
127			0.00	71.4	0.81	-	84.6	-0.064	5.83	0.468	16.0	38.1
128			0.00	71.4	0.85	-	84.5	-0.063	5.77	0.463	16.0	38.1
129			0.00	71.4	0.80	-	84.4	-0.063	5.72	0.458	16.0	38.1
130	22.121	0.173	0.00	71.4	0.86	103	84.4	-0.063	5.70	0.456	16.1	38.1
131			0.00	71.4	0.85	-	84.3	-0.063	5.58	0.445	16.1	37.9
132			0.00	71.3	0.87	-	84.3	-0.063	5.60	0.437	16.2	37.9
133			0.00	71.3	0.81	-	84.1	-0.062	5.59	0.430	16.3	38.1
134			0.00	71.3	0.81	-	84.1	-0.062	5.56	0.426	16.3	37.9
135			0.00	71.2	0.80	-	84.0	-0.062	5.60	0.423	16.6	37.8
136			0.00	71.3	0.80	-	83.9	-0.062	5.64	0.424	16.7	37.8
137			0.00	71.2	0.84	-	83.9	-0.062	5.47	0.446	16.7	37.6
138			0.00	71.3	0.83	-	83.9	-0.062	5.51	0.444	16.7	37.6
139			0.00	71.2	0.80	-	83.9	-0.062	5.53	0.432	16.7	37.6
140	23.857	0.174	0.00	71.2	0.83	103	83.8	-0.062	5.52	0.420	16.7	37.6
141			0.00	71.2	0.83	-	83.8	-0.061	5.49	0.410	16.8	37.6
142			0.00	71.2	0.81	-	83.8	-0.062	5.49	0.406	16.8	37.4
143			0.00	71.2	0.80	-	83.8	-0.061	5.48	0.403	16.8	37.6
144			0.00	71.2	0.81	-	83.8	-0.061	5.49	0.395	16.9	37.6
145			0.00	71.2	0.84	-	83.8	-0.061	5.47	0.393	16.9	37.6
146			0.00	71.2	0.85	-	83.8	-0.061	5.50	0.398	16.9	37.6
147			0.00	71.2	0.78	-	83.6	-0.060	5.44	0.392	16.9	37.6
148			0.00	71.2	0.82	-	83.7	-0.061	5.50	0.414	17.0	37.6
149			0.00	71.2	0.79	-	83.7	-0.061	5.54	0.412	17.0	37.6
150	25.595	0.174	0.00	71.2	0.82	104	83.8	-0.061	5.52	0.403	17.0	37.4
151			0.00	71.2	0.86	-	83.8	-0.060	5.53	0.399	17.0	37.4
152			0.00	71.2	0.85	-	83.5	-0.060	5.57	0.400	17.0	37.4
153			0.00	71.1	0.80	-	83.4	-0.060	5.54	0.394	17.1	37.6
154			0.00	71.1	0.86	-	83.3	-0.060	5.51	0.390	17.4	37.8
155			0.00	71.0	0.82	-	83.3	-0.060	5.55	0.386	17.3	37.8

Data from 12/21/2022 testing - Reference Only



## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
156			0.00	71.0	0.79	-	83.3	-0.060	5.46	0.375	17.3	37.8
157			0.00	71.0	0.85	-	83.2	-0.060	5.50	0.374	17.3	37.6
158			0.00	71.0	0.84	-	83.3	-0.060	5.45	0.372	17.3	37.6
159			0.00	71.0	0.80	-	83.3	-0.060	5.45	0.372	17.2	37.6
160	27.329	0.173	0.00	71.0	0.82	103	83.0	-0.060	5.44	0.367	17.3	37.6
161			0.00	71.1	0.86	-	82.9	-0.060	5.51	0.365	17.3	37.6
162			0.00	71.1	0.79	-	82.8	-0.059	5.31	0.368	17.3	37.4
163			0.00	71.1	0.81	-	82.8	-0.059	5.31	0.369	17.3	37.4
164			0.00	71.1	0.83	-	82.7	-0.060	5.30	0.368	17.4	37.4
165			0.00	71.1	0.82	-	82.6	-0.060	5.31	0.365	17.3	37.4
166			0.00	71.0	0.81	-	82.5	-0.059	5.31	0.364	17.4	37.4
167			0.00	70.9	0.81	-	82.5	-0.059	5.32	0.364	17.4	37.4
168			0.00	70.9	0.79	-	82.8	-0.059	5.00	0.366	17.4	37.4
169			0.00	70.8	0.80	-	82.8	-0.059	4.99	0.368	17.4	37.4
170	29.062	0.173	0.00	70.8	0.82	103	82.8	-0.059	4.97	0.360	17.4	37.4
171			0.00	70.9	0.86	-	82.8	-0.059	4.96	0.360	17.5	37.4
172			0.00	70.9	0.79	-	82.7	-0.059	4.94	0.353	17.5	37.4
173			0.00	70.9	0.79	-	82.7	-0.059	4.98	0.353	17.5	37.2
174			0.00	70.8	0.78	-	82.7	-0.059	4.99	0.353	17.6	37.2
175			0.00	70.8	0.85	-	82.7	-0.059	5.01	0.351	17.6	37.2
176			0.00	70.7	0.80	-	82.7	-0.058	5.04	0.349	17.6	37.2
177			0.00	70.7	0.85	-	82.6	-0.059	5.06	0.349	17.6	37.2
178			0.00	70.7	0.83	-	82.5	-0.059	5.08	0.347	17.6	37.2
179			0.00	70.8	0.80	-	82.6	-0.058	5.08	0.347	17.6	37.2
180	30.806	0.174	0.00	70.9	0.80	103	82.8	-0.059	5.10	0.345	17.5	37.2
181			0.00	70.9	0.84	-	82.9	-0.058	5.12	0.346	17.5	37.0
182			0.00	70.9	0.86	-	82.8	-0.058	5.14	0.347	17.5	37.0
183			0.00	70.8	0.86	-	82.7	-0.059	5.13	0.344	17.5	37.0
184			0.00	70.8	0.80	-	82.7	-0.058	5.21	0.348	17.6	37.0
185			0.00	70.8	0.85	-	82.6	-0.058	4.88	0.363	17.6	37.0
186			0.00	70.8	0.88	-	82.6	-0.057	4.97	0.354	17.6	37.0
187			0.00	70.7	0.86	-	82.6	-0.059	5.04	0.354	17.5	37.0
188			0.00	70.7	0.83	-	82.6	-0.058	5.00	0.350	17.6	37.0
189			0.00	70.8	0.81	-	82.6	-0.058	5.01	0.347	17.6	37.0
190	32.539	0.173	0.00	70.8	0.84	103	82.8	-0.058	5.02	0.343	17.7	37.0
191			0.00	70.8	0.86	-	83.0	-0.058	5.06	0.345	17.7	37.0
192			0.00	70.9	0.80	-	83.3	-0.058	5.09	0.343	17.6	37.0
193			0.00	70.9	0.87	-	83.5	-0.057	5.06	0.349	17.7	37.0
194			0.00	70.9	0.81	-	83.7	-0.058	5.02	0.343	17.7	37.0

Data from 12/21/2022 testing - Reference only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
195			0.00	70.9	0.86	-	84.1	-0.058	5.02	0.345	17.7	36.9
196			0.00	70.9	0.82	-	84.3	-0.058	4.99	0.340	17.7	36.9
197			0.00	70.9	0.86	-	84.7	-0.058	4.84	0.368	17.7	36.9
198			0.00	70.9	0.80	-	84.8	-0.058	4.84	0.362	17.7	36.9
199			0.00	70.9	0.83	-	85.0	-0.058	4.88	0.359	17.7	36.9
200	34.276	0.174	0.00	70.9	0.82	103	85.2	-0.058	4.85	0.355	17.7	36.9
201			0.00	70.9	0.82	-	85.4	-0.058	4.85	0.356	17.7	36.9
202			0.00	70.9	0.84	-	85.5	-0.058	4.88	0.361	17.7	37.0
203			0.00	70.9	0.87	-	85.5	-0.058	4.89	0.364	17.8	37.0
204			0.00	70.9	0.82	-	85.6	-0.058	4.84	0.363	17.8	37.0
205			0.00	70.8	0.87	-	85.7	-0.058	4.82	0.359	17.9	37.0
206			0.00	70.9	0.85	-	85.8	-0.058	4.75	0.354	17.9	37.0
207			0.00	70.9	0.83	-	85.8	-0.057	4.75	0.359	17.9	37.0
208			0.00	70.9	0.88	-	85.9	-0.057	4.77	0.360	17.9	36.9
209			0.00	70.9	0.81	-	85.9	-0.058	4.78	0.358	17.9	36.9
210	36.004	0.173	0.00	70.9	0.88	102	85.9	-0.057	4.75	0.360	17.9	36.9
211			0.00	71.0	0.84	-	86.2	-0.057	4.63	0.361	17.9	36.9
212			0.00	70.9	0.81	-	86.2	-0.057	4.25	0.360	17.9	36.9
213			0.00	70.9	0.81	-	86.3	-0.057	4.22	0.354	17.9	36.7
214			0.00	70.9	0.84	-	86.2	-0.057	4.22	0.351	18.0	36.9
215			0.00	70.9	0.88	-	86.3	-0.056	4.21	0.349	18.0	36.9
216			0.00	70.9	0.82	-	86.4	-0.056	4.21	0.348	18.0	36.7
217			0.00	70.9	0.83	-	86.2	-0.056	4.18	0.347	18.0	36.7
218			0.00	70.9	0.87	-	86.0	-0.056	4.17	0.346	18.1	36.7
219			0.00	70.9	0.82	-	85.7	-0.055	4.20	0.349	18.1	36.7
220	37.752	0.175	0.00	71.0	0.85	104	85.5	-0.056	4.20	0.349	18.1	36.7
221			0.00	71.0	0.86	-	85.2	-0.055	4.18	0.348	18.1	36.7
222			0.00	71.0	0.89	-	85.2	-0.055	4.17	0.353	18.1	36.7
223			0.00	71.1	0.88	-	85.1	-0.055	4.17	0.354	18.2	36.7
224			0.00	71.1	0.87	-	85.0	-0.055	4.21	0.360	18.2	36.7
225			0.00	71.1	0.89	-	84.9	-0.055	4.21	0.360	18.2	36.7
226			0.00	71.1	0.86	-	84.9	-0.055	4.21	0.357	18.2	36.7
227			0.00	71.1	0.87	-	84.9	-0.055	4.22	0.360	18.2	36.5
228			0.00	71.0	0.83	-	84.9	-0.055	4.21	0.357	18.3	36.5
229			0.00	71.1	0.81	-	85.0	-0.055	4.19	0.353	18.2	36.5
230	39.496	0.174	0.00	71.1	0.82	103	85.0	-0.055	4.21	0.357	18.4	36.5
231			0.00	71.1	0.87	-	85.0	-0.054	4.22	0.355	18.4	36.3
232			0.00	71.1	0.81	-	85.0	-0.055	4.22	0.354	18.5	36.3
233			0.00	71.1	0.88	-	85.0	-0.054	4.24	0.358	18.5	36.3

Data from 12/21/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
234			0.00	71.1	0.88	-	85.0	-0.054	4.23	0.357	18.5	36.3
235			0.00	71.1	0.85	-	85.0	-0.054	4.23	0.356	18.5	36.3
236			0.00	71.1	0.86	-	85.0	-0.054	3.93	0.358	18.5	36.3
237			0.00	71.1	0.80	-	84.9	-0.054	3.94	0.351	18.5	36.3
238			0.00	71.0	0.81	-	84.9	-0.054	3.99	0.352	18.6	36.3
239			0.00	71.0	0.87	-	84.9	-0.054	3.88	0.344	18.6	36.3
240	41.237	0.174	0.00	71.0	0.88	102	84.8	-0.054	3.86	0.343	18.6	36.1
241			0.00	71.0	0.86	-	84.7	-0.054	3.82	0.340	18.6	36.3
242			0.00	71.0	0.85	-	84.6	-0.054	3.79	0.338	18.6	36.1
243			0.00	71.0	0.83	-	84.5	-0.054	3.78	0.337	18.6	36.1
244			0.00	71.0	0.83	-	84.5	-0.053	3.77	0.337	18.7	36.1
245			0.00	70.9	0.85	-	84.5	-0.054	3.75	0.338	18.7	36.1
246			0.00	70.9	0.86	-	84.7	-0.053	3.72	0.336	18.7	36.1
247			0.00	70.9	0.87	-	84.7	-0.053	3.63	0.326	18.7	36.1
248			0.00	71.0	0.83	-	84.6	-0.053	3.57	0.321	18.7	36.1
249			0.00	70.9	0.81	-	84.7	-0.053	3.55	0.319	18.7	36.1
250	42.985	0.175	0.00	70.9	0.84	103	84.7	-0.053	3.55	0.324	18.7	36.1
251			0.00	70.9	0.8	-	84.8	-0.052	3.54	0.319	18.7	36.1
252			0.00	70.9	0.87	-	84.9	-0.051	3.52	0.323	18.8	36.0
253			0.00	70.9	0.81	-	84.9	-0.052	3.55	0.330	18.8	36.0
254			0.00	70.9	0.80	-	84.9	-0.052	3.50	0.325	18.8	36.0
255			0.00	70.9	0.88	-	84.8	-0.052	3.45	0.321	18.9	36.0
256			0.00	70.9	0.89	-	84.6	-0.051	3.46	0.323	18.8	36.0
257			0.00	70.8	0.85	-	84.6	-0.051	3.44	0.324	18.9	36.0
258			0.00	70.8	0.87	-	84.6	-0.052	3.46	0.331	18.9	36.0
259			0.00	70.8	0.86	-	84.6	-0.051	3.49	0.341	19.0	36.0
260	44.724	0.174	0.00	70.8	0.84	102	84.5	-0.052	3.42	0.325	19.0	36.0
261			0.00	70.8	0.80	-	84.6	-0.051	3.42	0.323	19.0	36.0
262			0.00	70.8	0.85	-	84.7	-0.051	3.40	0.322	19.0	36.0
263			0.00	70.8	0.85	-	84.7	-0.051	3.39	0.324	19.0	36.0
264			0.00	70.8	0.84	-	84.8	-0.051	3.35	0.322	19.0	36.0
265			0.00	70.9	0.82	-	84.8	-0.050	3.33	0.322	19.0	36.0
266			0.00	70.8	0.87	-	84.8	-0.050	3.31	0.324	19.1	35.8
267			0.00	70.8	0.83	-	84.7	-0.051	3.28	0.321	19.1	35.8
268			0.00	70.8	0.81	-	84.7	-0.050	3.27	0.324	19.1	35.8
269			0.00	70.8	0.79	-	84.7	-0.050	3.20	0.336	19.1	35.8
270	46.450	0.173	0.00	70.8	0.85	101	84.7	-0.050	3.18	0.331	19.1	35.8
271			0.00	70.8	0.84	-	84.6	-0.050	3.18	0.332	19.2	35.8
272			0.00	70.8	0.80	-	84.6	-0.050	3.19	0.337	19.2	35.8

Data from 12/21/2022 testing - Reference Only

## BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data			Tunnel Moisture	
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)	R/H (%)	Dew Point (F)
273			0.00	70.8	0.86	-	84.5	-0.049	3.18	0.335	19.2	35.8
274			0.00	70.7	0.83	-	84.6	-0.049	3.16	0.334	19.2	35.8
275			0.00	70.8	0.82	-	84.6	-0.049	3.15	0.335	19.3	35.8
276			0.00	70.8	0.88	-	84.6	-0.049	3.17	0.342	19.3	35.8
277			0.00	70.8	0.89	-	84.7	-0.049	3.14	0.335	19.3	35.8
278			0.00	70.8	0.82	100	84.7	-0.049	3.14	0.335	19.3	35.8
Avg/Tot	46.450	0.172	0.00	71.1	0.76	103	83.9	-0.072	7.75	0.450	18.04	42.777

Data from 12/2022 testing - Reference only

# BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	0.000		0.00	70.2	0.00		82.6
1			0.00	70.3	0.00	-	82.7
2			0.00	70.3	0.00	-	83.9
3			0.00	70.3	0.00	-	84.7
4			0.00	70.3	0.00	-	85.3
5			0.00	70.3	0.00	-	84.7
6			0.00	70.2	0.00	-	84.4
7			0.00	70.2	0.00	-	84.3
8			0.00	70.2	0.00	-	84.3
9			0.00	70.2	0.00	-	84.2
10	2.134	0.213	0.00	70.2	0.00	106	84.3
11			0.00	70.2	0.00	-	84.1
12			0.00	70.2	0.00	-	84.0
13			0.00	70.2	0.00	-	83.8
14			0.00	70.2	0.00	-	83.7
15			0.00	70.2	0.00	-	83.6
16			0.00	70.2	0.00	-	83.5
17			0.00	70.2	0.00	-	83.3
18			0.00	70.2	0.00	-	83.1
19			0.00	70.2	0.00	-	83.0
20	4.252	0.212	0.00	70.2	0.00	104	82.8
21			0.00	70.2	0.00	-	82.9
22			0.00	70.2	0.00	-	82.8
23			0.00	70.1	0.00	-	82.7
24			0.00	70.2	0.00	-	82.7
25			0.00	70.2	0.00	-	82.6
26			0.00	70.2	0.00	-	82.5
27			0.00	70.2	0.00	-	82.5
28			0.00	70.2	0.00	-	82.4
29			0.00	70.1	0.00	-	82.4
30	6.359	0.211	0.00	70.1	0.00	104	82.4
31			0.00	70.2	0.00	-	82.4

Data from 12/2022 testing - Reference only

## BOX C TEST DATA - ASTM E3053 / ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32			0.00	70.1	0.00	-	82.4
33			0.00	70.1	0.00	-	82.4
34			0.00	70.1	0.00	-	82.3
35			0.00	70.1	0.00	-	82.3
36			0.00	70.1	0.00	-	82.3
37			0.00	70.1	0.00	-	82.3
38			0.00	70.2	0.00	-	82.3
39			0.00	70.2	0.00	-	82.4
40	8.397	0.204	0.00	70.1	0.00	101	82.4
41			0.00	70.2	0.00	-	82.4
42			0.00	70.2	0.00	-	82.4
43			0.00	70.1	0.00	-	82.4
44			0.00	70.2	0.00	-	82.4
45			0.00	70.1	0.00	-	82.4
46			0.00	70.2	0.00	-	82.4
47			0.00	70.2	0.00	-	82.4
48			0.00	70.2	0.00	-	82.4
49			0.00	70.2	0.00	-	82.5
50	10.461	0.206	0.00	70.2	0.00	103	82.5
51			0.00	70.1	0.00	-	82.5
52			0.00	70.2	0.00	-	82.6
53			0.00	70.2	0.00	-	82.5
54			0.00	70.2	0.00	-	82.5
55			0.00	70.1	0.00	-	82.5
56			0.00	70.2	0.00	-	82.6
57			0.00	70.2	0.00	-	82.5
58			0.00	70.1	0.00	-	82.5
59			0.00	70.1	0.00	-	82.5
60	12.453	0.199	0.00	70.2	0.00	99	82.5
Avg/Tot	12.453	0.208	0.00	70.2	0.00	103	82.9

Data from 12/2022 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
0	561.3	449.8	526.8	414.0	419.2	474.2	0
1	534.2	450.9	524.0	413.1	418.4	468.1	0
2	506.7	452.9	520.4	411.1	417.5	461.7	0
3	493.0	454.5	514.2	410.6	417.1	457.9	0
4	508.6	455.1	506.6	409.3	415.9	459.1	0
5	538.9	454.0	496.5	407.6	414.1	462.2	0
6	567.5	452.5	485.6	405.1	412.2	464.6	0
7	587.5	450.6	474.9	402.5	409.9	465.1	0
8	599.4	448.2	464.8	399.8	407.5	463.9	0
9	608.9	445.5	455.3	397.3	404.6	462.3	0
10	617.4	442.9	446.7	394.4	402.2	460.7	0
11	624.9	440.3	438.6	392.0	400.3	459.2	0
12	632.6	437.7	431.3	389.7	398.4	458.0	0
13	642.5	435.2	424.3	387.6	396.3	457.2	0
14	652.2	432.5	418.3	385.8	394.5	456.6	0
15	659.1	429.7	412.8	384.2	392.0	455.6	0
16	665.9	427.1	408.0	382.3	390.1	454.7	0
17	673.5	424.4	403.6	380.4	387.7	453.9	0
18	680.1	421.5	399.5	378.4	385.3	453.0	0
19	688.5	418.5	395.6	376.7	383.2	452.5	0
20	697.3	414.8	391.7	374.6	380.2	451.7	0
21	705.4	411.1	387.2	372.3	377.1	450.8	0
22	711.5	408.1	385.1	369.4	372.8	449.4	0
23	717.2	405.0	382.2	366.9	369.1	448.1	0
24	723.3	401.9	379.6	364.8	366.7	447.2	0
25	728.8	398.7	377.2	362.8	363.9	446.3	0
26	735.0	395.6	375.0	360.9	361.2	445.5	0
27	743.0	392.6	373.0	359.5	359.0	445.4	0
28	752.0	389.9	371.1	358.0	357.2	445.6	0
29	760.4	386.6	369.3	356.6	355.9	445.8	0
30	769.6	383.9	367.9	355.5	354.4	446.3	0
31	777.8	381.5	367.0	354.8	353.3	446.9	0
32	785.3	379.1	366.1	354.2	352.5	447.4	0
33	791.0	376.8	365.4	353.7	351.9	447.8	0
34	795.4	374.6	365.1	353.6	351.3	448.0	0
35	799.0	372.4	365.0	353.7	350.7	448.2	0
36	803.1	370.4	365.1	353.8	350.6	448.6	0
37	806.6	368.3	365.3	354.0	350.5	448.9	0
38	810.0	366.4	365.7	354.3	350.0	449.3	0
39	813.8	364.6	366.1	354.8	349.8	449.8	0
40	816.6	362.8	366.7	355.5	350.0	450.3	0
41	819.2	361.2	367.4	356.1	350.2	450.9	0
42	821.4	359.7	368.3	356.6	350.6	451.3	0
43	824.3	358.2	369.2	357.4	351.2	452.1	0
44	825.9	356.7	370.1	358.3	351.8	452.5	0
45	826.4	355.5	371.2	359.3	352.6	453.0	0
46	827.6	354.2	372.3	360.2	353.2	453.5	0
47	829.0	352.9	373.5	361.1	353.7	454.0	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
48	830.8	351.8	374.8	362.1	354.6	454.8	0
49	833.4	350.7	376.2	363.3	355.9	455.9	0
50	836.0	349.6	377.6	364.4	357.3	457.0	0
51	839.2	348.6	379.2	365.6	358.7	458.2	0
52	841.9	347.7	380.9	366.8	359.9	459.4	0
53	844.7	347.0	383.0	367.9	361.4	460.8	0
54	847.4	346.4	385.0	369.1	362.7	462.1	0
55	850.3	345.8	387.0	370.3	364.5	463.6	0
56	852.1	345.2	389.2	371.6	365.6	464.7	0
57	853.5	344.7	391.4	372.7	366.7	465.8	0
58	855.5	344.3	394.0	373.8	367.9	467.1	0
59	858.1	343.9	396.5	375.0	369.9	468.7	0
60	859.6	343.8	399.4	376.2	371.3	470.1	0
61	861.4	343.7	402.4	377.5	372.7	471.5	0
62	863.7	343.6	405.4	378.5	374.2	473.1	0
63	865.8	343.7	408.8	379.7	375.3	474.7	0
64	867.3	343.8	412.2	380.9	377.0	476.3	0
65	866.1	343.7	415.5	381.9	378.3	477.1	0
66	861.9	343.8	418.9	382.9	379.8	477.5	0
67	856.3	343.9	422.0	384.0	381.6	477.6	0
68	851.4	344.2	425.2	385.2	383.2	477.8	0
69	844.0	344.6	428.2	386.2	384.9	477.6	0
70	836.6	345.2	431.0	387.4	386.9	477.4	0
71	828.2	345.6	433.6	388.2	388.6	476.8	0
72	818.9	346.2	436.0	389.1	390.0	476.0	0
73	809.7	346.3	438.0	389.7	392.8	475.3	0
74	800.8	346.9	439.9	390.5	395.2	474.7	0
75	790.8	347.4	441.9	391.3	397.2	473.7	0
76	780.9	348.2	443.9	392.0	399.0	472.8	0
77	771.3	348.6	446.0	392.8	400.4	471.9	0
78	762.1	349.4	448.1	393.6	401.5	470.9	0
79	753.4	350.2	450.3	393.9	402.5	470.1	0
80	744.8	351.0	452.5	394.1	403.1	469.1	0
81	736.7	352.0	454.7	394.6	403.6	468.3	0
82	728.3	352.9	456.9	394.4	404.0	467.3	0
83	719.9	353.8	459.0	394.8	404.1	466.3	0
84	711.4	354.9	460.9	394.7	404.1	465.2	0
85	703.0	355.9	462.6	394.7	404.1	464.1	0
86	695.4	357.0	464.0	394.4	403.8	462.9	0
87	687.2	358.1	465.3	393.9	403.5	461.6	0
88	678.7	359.2	466.4	393.4	403.1	460.2	0
89	671.1	360.3	467.2	392.9	402.6	458.8	0
90	663.0	361.5	467.4	392.6	402.2	457.3	0
91	654.3	362.5	467.4	392.1	401.7	455.6	0
92	644.0	363.6	467.1	391.9	401.1	453.5	0
93	633.3	364.4	466.5	391.1	400.3	451.1	0
94	622.5	365.2	465.6	390.2	399.4	448.6	0
95	612.3	366.4	464.3	390.4	399.4	446.6	0



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
96	602.0	367.2	463.0	390.3	399.1	444.3	0
97	592.2	368.0	461.5	389.8	398.7	442.0	0
98	583.0	368.7	459.7	389.2	398.1	439.7	0
99	574.0	369.3	457.6	388.5	397.5	437.4	0
100	565.7	370.0	455.4	387.8	396.7	435.1	0
101	558.1	370.5	453.1	386.8	395.8	432.9	0
102	550.4	370.9	450.7	385.8	394.9	430.5	0
103	542.3	371.2	448.3	384.7	394.0	428.1	0
104	534.8	371.4	446.0	383.3	392.9	425.7	0
105	527.5	371.5	443.7	381.9	391.8	423.3	0
106	520.6	371.4	441.6	380.5	390.8	421.0	0
107	514.1	371.2	439.5	379.3	389.7	418.7	0
108	508.0	371.2	437.5	377.9	388.6	416.6	0
109	502.4	370.8	435.5	376.2	387.4	414.5	0
110	497.3	370.5	433.5	374.8	386.1	412.4	0
111	492.6	370.1	431.6	373.2	384.8	410.5	0
112	488.3	369.7	429.9	371.6	383.5	408.6	0
113	484.5	369.2	428.2	370.0	382.2	406.8	0
114	480.6	368.8	426.5	368.4	380.8	405.0	0
115	477.3	368.4	424.9	367.0	379.5	403.4	0
116	474.0	367.9	423.4	365.7	378.2	401.8	0
117	470.4	367.5	421.9	364.2	376.8	400.2	0
118	466.8	367.1	420.3	362.6	375.5	398.5	0
119	463.0	366.8	418.7	361.3	374.2	396.8	0
120	459.6	366.5	416.9	360.0	372.8	395.2	0
121	456.1	366.1	415.2	358.9	371.6	393.6	0
122	453.0	365.8	413.5	357.8	370.3	392.1	0
123	449.7	365.4	411.9	356.8	369.2	390.6	0
124	446.6	365.1	410.4	355.6	367.9	389.1	0
125	443.7	364.7	409.0	354.5	366.8	387.7	0
126	441.3	364.4	407.8	353.4	365.6	386.5	0
127	438.8	363.9	406.6	352.2	364.5	385.2	0
128	436.4	363.5	405.4	351.1	363.3	384.0	0
129	434.3	363.1	404.3	350.1	362.2	382.8	0
130	432.0	362.6	403.1	348.9	361.2	381.5	0
131	429.6	362.1	402.0	348.0	360.2	380.4	0
132	427.7	361.5	400.8	346.9	359.3	379.3	0
133	425.3	361.0	399.7	346.0	358.4	378.1	0
134	423.2	360.5	398.4	345.0	357.4	376.9	0
135	420.9	360.2	397.2	344.7	356.9	376.0	0
136	419.1	359.9	396.0	344.1	356.2	375.1	0
137	417.4	359.8	394.8	343.6	355.5	374.2	0
138	415.7	359.5	393.5	342.8	354.8	373.3	0
139	414.2	359.3	392.1	342.0	354.1	372.3	0
140	412.7	358.9	390.6	341.3	353.4	371.4	0
141	411.2	358.6	389.1	340.5	352.8	370.5	0
142	409.6	358.3	387.7	339.6	352.2	369.5	0
143	408.2	357.8	386.1	338.7	351.5	368.5	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
144	406.8	357.4	384.6	338.0	350.8	367.5	0
145	405.6	356.9	383.2	337.0	350.2	366.6	0
146	404.4	356.5	381.7	336.2	349.6	365.7	0
147	403.3	356.1	380.3	335.4	349.1	364.8	0
148	402.0	355.6	378.9	334.4	348.4	363.9	0
149	401.1	355.3	377.6	333.7	347.9	363.1	0
150	400.1	354.8	376.3	332.9	347.5	362.3	0
151	399.5	354.3	375.2	332.1	347.0	361.6	0
152	398.8	353.9	374.1	331.3	346.5	360.9	0
153	397.8	353.4	373.1	330.5	346.2	360.2	0
154	397.3	352.8	372.1	329.5	345.7	359.5	0
155	396.6	352.2	371.3	328.9	345.2	358.8	0
156	396.1	351.6	370.4	328.1	344.9	358.2	0
157	395.4	351.0	369.5	327.2	344.5	357.5	0
158	394.9	350.4	368.8	326.6	344.2	357.0	0
159	394.5	349.9	368.0	325.9	343.9	356.4	0
160	394.1	349.2	367.3	325.2	343.5	355.9	0
161	393.8	348.6	366.7	324.4	343.1	355.3	0
162	393.2	348.1	366.0	323.8	342.8	354.8	0
163	392.6	347.5	365.4	323.2	342.4	354.2	0
164	392.2	347.0	364.9	322.7	342.1	353.8	0
165	391.5	346.5	364.4	321.9	341.6	353.2	0
166	391.0	346.0	363.9	321.3	341.4	352.7	0
167	390.6	345.6	363.4	320.7	341.0	352.3	0
168	390.0	345.1	362.9	320.0	340.6	351.7	0
169	389.5	344.7	362.4	319.4	340.2	351.2	0
170	388.9	344.3	361.8	318.8	339.7	350.7	0
171	388.0	344.0	361.2	318.2	339.2	350.1	0
172	387.1	343.7	360.5	317.6	338.7	349.5	0
173	386.1	343.3	359.7	316.9	338.2	348.9	0
174	385.6	342.9	358.9	316.3	337.7	348.3	0
175	384.6	342.5	358.2	315.7	337.1	347.6	0
176	383.9	342.2	357.4	315.2	336.6	347.1	0
177	383.3	341.9	356.6	314.7	335.9	346.5	0
178	382.7	341.5	355.9	314.0	335.3	345.9	0
179	382.0	341.2	355.2	313.4	334.8	345.3	0
180	381.5	340.9	354.5	312.8	334.1	344.8	0
181	381.0	340.6	353.8	312.2	333.6	344.2	0
182	380.4	340.3	353.3	311.6	333.0	343.7	0
183	380.3	340.0	352.8	310.9	332.4	343.3	0
184	379.8	339.6	352.3	310.4	331.9	342.8	0
185	379.2	339.3	351.8	309.8	331.3	342.3	0
186	378.7	339.1	351.4	309.4	330.6	341.8	0
187	378.0	338.8	351.0	308.8	330.1	341.4	0
188	377.6	338.6	350.7	308.4	329.5	340.9	0
189	377.2	338.3	350.2	307.8	329.0	340.5	0
190	376.8	338.1	349.7	307.4	328.3	340.1	0
191	376.5	337.8	349.3	306.9	327.9	339.7	0

Data from 12/20/22 testing - Reference only

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right			
192	376.2	337.6	348.9	306.4	327.4	339.3	0	
193	376.0	337.3	348.4	306.0	326.9	338.9	0	
194	375.6	337.1	347.9	305.5	326.4	338.5	0	
195	375.2	336.8	347.5	305.1	325.9	338.1	0	
196	374.9	336.5	347.2	304.6	325.5	337.7	0	
197	374.7	336.2	346.8	304.3	324.9	337.4	0	
198	374.4	335.9	346.4	304.0	324.5	337.1	0	
199	374.4	335.6	346.1	303.5	324.1	336.7	0	
200	374.0	335.2	345.8	303.2	323.6	336.4	0	
201	373.8	334.9	345.4	302.8	323.2	336.0	0	
202	373.6	334.5	345.1	302.4	322.8	335.6	0	
203	373.3	334.0	344.7	302.1	322.2	335.3	0	
204	373.0	333.6	344.3	301.6	321.8	334.9	0	
205	372.7	333.2	343.9	301.2	321.3	334.5	0	
206	372.3	332.7	343.4	300.9	320.8	334.0	0	
207	371.8	332.2	343.0	300.7	320.3	333.6	0	
208	371.4	331.7	342.5	300.3	319.8	333.1	0	
209	371.2	331.1	342.1	299.9	319.2	332.7	0	
210	371.1	330.6	341.7	299.5	318.8	332.3	0	
211	370.5	330.1	341.3	299.3	318.3	331.9	0	
212	369.6	329.7	340.8	298.8	317.8	331.3	0	
213	368.2	329.2	340.3	298.4	317.4	330.7	0	
214	366.8	328.7	339.7	298.1	316.9	330.1	0	
215	365.3	328.3	339.1	297.7	316.5	329.4	0	
216	363.7	327.7	338.5	297.3	316.2	328.7	0	
217	362.4	327.2	337.7	297.0	315.7	328.0	0	
218	361.1	326.7	336.9	296.5	315.2	327.3	0	
219	359.7	326.2	336.2	296.1	314.9	326.6	0	
220	358.6	325.7	335.4	295.6	314.4	325.9	0	
221	357.4	325.2	334.6	295.1	313.8	325.2	0	
222	356.0	324.7	333.8	294.7	313.4	324.5	0	
223	355.0	324.2	333.0	294.2	312.8	323.8	0	
224	354.0	323.7	332.2	293.7	312.4	323.2	0	
225	353.1	323.1	331.4	293.2	311.9	322.5	0	
226	352.0	322.6	330.7	292.8	311.3	321.9	0	
227	351.2	322.1	329.9	292.3	310.8	321.3	0	
228	350.4	321.6	329.2	291.8	310.1	320.6	0	
229	349.6	321.1	328.6	291.2	309.5	320.0	0	
230	348.9	320.6	327.9	290.8	308.9	319.4	0	
231	348.2	320.2	327.3	290.4	308.4	318.9	0	
232	347.6	319.6	326.7	289.9	307.9	318.3	0	
233	346.9	319.1	326.2	289.4	307.3	317.8	0	
234	346.3	318.7	325.7	288.9	306.7	317.2	0	
235	345.6	318.3	325.2	288.6	306.0	316.7	0	
236	345.0	317.8	324.7	288.2	305.4	316.2	0	
237	344.2	317.3	324.2	287.7	304.8	315.7	0	
238	343.4	316.9	323.7	287.4	304.3	315.1	0	
239	342.5	316.4	323.2	287.0	303.8	314.6	0	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	
240	341.8	316.0	322.6	286.7	303.1	314.0	0
241	340.9	315.5	322.0	286.2	302.5	313.4	0
242	340.0	315.0	321.4	285.9	301.9	312.8	0
243	339.2	314.5	320.7	285.4	301.3	312.2	0
244	338.2	313.9	320.0	285.2	300.6	311.6	0
245	337.2	313.2	319.3	284.6	300.0	310.9	0
246	336.0	312.6	318.5	284.2	299.4	310.1	0
247	335.0	311.9	317.8	283.7	298.8	309.5	0
248	333.9	311.3	317.1	283.3	298.2	308.8	0
249	332.8	310.6	316.4	282.8	297.6	308.0	0
250	331.7	309.8	315.7	282.3	297.0	307.3	0
251	330.7	309.1	314.9	281.8	296.3	306.6	0
252	329.6	308.3	314.3	281.3	295.7	305.8	0
253	328.4	307.5	313.6	280.8	295.0	305.1	0
254	327.4	306.6	312.9	280.2	294.4	304.3	0
255	326.2	305.8	312.3	279.6	293.8	303.5	0
256	325.1	304.9	311.6	278.9	293.2	302.7	0
257	324.0	304.1	311.0	278.4	292.5	302.0	0
258	323.2	303.2	310.3	277.8	291.8	301.3	0
259	322.4	302.4	309.6	277.3	291.1	300.6	0
260	321.7	301.7	308.9	276.6	290.5	299.9	0
261	321.0	300.9	308.0	276.0	289.8	299.1	0
262	320.2	300.2	307.2	275.4	289.1	298.4	0
263	319.5	299.6	306.3	274.9	288.4	297.7	0
264	318.6	298.8	305.4	274.4	287.7	297.0	0
265	317.8	298.1	304.5	273.8	287.1	296.2	0
266	316.9	297.3	303.6	273.1	286.4	295.5	0
267	316.1	296.6	302.7	272.5	285.7	294.7	0
268	315.3	295.8	301.9	272.0	285.1	294.0	0
269	314.1	295.1	301.0	271.5	284.4	293.2	0
270	313.0	294.3	300.2	270.9	283.7	292.4	0
271	311.7	293.5	299.3	270.2	283.1	291.6	0
272	310.8	292.9	298.7	269.5	282.5	290.9	0
273	309.6	292.0	298.0	269.0	281.8	290.1	0
274	308.6	291.3	297.4	268.4	281.1	289.4	0
275	307.6	290.6	296.9	267.7	280.4	288.7	0
276	306.7	289.9	296.4	267.0	279.8	288.0	0
277	305.7	289.2	296.1	266.4	279.2	287.3	0
278	305.7	289.2	296.1	266.4	279.2	287.3	0
Average	512.4	351.1	379.9	338.0	349.1	386	0

## LAB SAMPLE DATA - ASTM E2515

Client: SBI  
 Model: 1.7R  
 Run #: 6

Job #: 22-835  
 Tracking #: 135  
 Technician: AK  
 Date: 12/21/2022

		Sample ID	Tare, mg		Final, mg	Catch, mg
<b>Filters</b>	<b>A</b>	H0131	188.4		191.5	3.1
	<b>B</b>	H0132	188.1		191.3	3.2
	<b>C - 1st Hour</b>	H0133	188.0		190.7	2.7
	<b>Amb</b>	H0151	89.6		89.7	0.1
<b>Probes</b>	<b>A</b>	16A	116379.8		116379.8	0.0
	<b>B</b>	16B	115860.4		115860.4	0.0
	<b>C - 1st Hour</b>	16C	114147.9		114147.9	0.0
<b>O-rings</b>	<b>A</b>	16A	3572.9		3572.7	0.0*
	<b>B</b>	16B	3638.7		3638.6	0.0*
	<b>C - 1st Hour</b>	16C	3601.8		3601.8	0.0

\*Negative value corrected to zero

**Placed in Dessicator on:** 12/25/2022

<b>Filters</b>	<b>A</b>	191.8	12/21 4:58	191.6	12/31 12:01	191.5	1/3 9:44		
	<b>B</b>	191.3	12/21 4:58	191.2	12/31 12:01	191.3	1/3 9:44		
	<b>C - 1st Hour</b>	190.9	12/21 4:58	190.6	12/31 12:01	190.7	1/3 9:44		
	<b>Amb</b>	89.6	12/21 4:58	89.7	12/31 12:13	89.7	1/3 9:44		
<b>Probes</b>	<b>A</b>			116379.9	12/31 12:08	116379.8	1/3 9:44		
	<b>B</b>			115860.5	12/31 12:08	115860.4	1/3 9:44		
	<b>C - 1st Hour</b>			114148.0	12/31 12:08	114147.9	1/3 9:44		
<b>O-Rings</b>	<b>A</b>			3572.9	12/31 12:01	3572.6	1/3 9:45	3572.7	1/4 10:32
	<b>B</b>			3638.6	12/31 12:01	3638.6	1/3 9:45		
	<b>C - 1st Hour</b>			3601.9	12/31 12:01	3601.8	1/3 9:45		

<b>Train A Aggregate, mg:</b>	<b>3.1</b>
<b>Train B Aggregate, mg:</b>	<b>3.2</b>
<b>Train C Aggregate, mg:</b>	<b>2.7</b>
<b>Ambient Aggregate, mg:</b>	<b>0.1</b>



Intertek

December/Décembre 2018

Control Number (SA) : 4002461

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION  
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

STANDARDS / NORMES D'ESSAI:

Certified to/Certifié selon CAN/ULC S627 Certified to/Certifié selon CSA B415.1

Certified to/Certifié selon UL 1482 Certified to/Certifié selon ASTM E3053

Certified to/Certifié selon UL 737

Certified to/Certifié selon ASTM E2515

LISTED SOLID FUEL BURNING  
APPLIANCE

POÈLE À COMBUSTIBLE SOLIDE  
HOMOLOGUÉE

MODEL / MODÈLE :

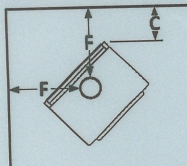
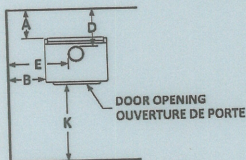
BLACKCOMB II

Serial Number

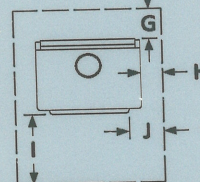
No. de Série

99999

### Clearances to combustibles / Dégagements aux combustibles



Back / Arrière



MOBILE HOME  
MAISONS MOBILES  
Double wall connector  
Tuyau à paroi double

A: 10 in./po. (254 mm) D: 13.5 in./po. (343 mm)  
B: 14.5 in./po. (368 mm) E: 23.5 in./po. (597 mm)  
C: 12 in./po. (305 mm) F: 20.75 in./po. (527 mm)

U.S.A.

Single wall connector  
Tuyau à paroi simple

Double wall connector  
Tuyau à paroi double

Protection de plancher/Floor protection  
CANADA U.S.A.

CANADA

Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double
A: 14.5 in./po. (368 mm)	A: 7.5 in./po. (191 mm)
B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)
C: 12 in./po. (305 mm)	C: 12 in./po. (305 mm)
D: 18 in./po. (457 mm)	D: 11 in./po. (279 mm)
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)
F: 20.75 in./po. (527 mm)	F: 20.75 in./po. (527 mm)

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)

U.S.A.

Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double
A: 13 in./po. (330 mm)	A: 7.5 in./po. (191 mm)
B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)
C: 12 in./po. (305 mm)	C: 12 in./po. (305 mm)
D: 16.5 in./po. (419 mm)	D: 11 in./po. (279 mm)
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)
F: 20.75 in./po. (527 mm)	F: 20.75 in./po. (527 mm)

U.S.A.

Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double
A: 13 in./po. (330 mm)	A: 7.5 in./po. (191 mm)
B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)
C: 12 in./po. (305 mm)	C: 12 in./po. (305 mm)
D: 16.5 in./po. (419 mm)	D: 11 in./po. (279 mm)
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)
F: 20.75 in./po. (527 mm)	F: 20.75 in./po. (527 mm)

Protection de plancher/Floor protection  
CANADA U.S.A.

CANADA	U.S.A.
G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)
H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
K: 48 in./po. (1219 mm)	

\* See owner's manual for other clearances with lowered ceiling/  
voir manuel d'installation pour autres dégagements avec plafond abaissé

### PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm /6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- This stove must be installed as a freestanding heater with the clearances listed in the manufacturer's installation instructions. It is strictly forbidden to install this stove in a factory-built fireplace.
- The space heater must be installed with legs or pedestal provided, attached as shown in the installation instruction.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- For use with solid fuel only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

### PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du fabricant pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ce poêle doit être installé comme appareil de chauffage autonome avec les dégagements indiqués dans les instructions d'installation du fabricant. Il est strictement défendu d'installer ce poêle dans un foyer préfabriqué.
- Le poêle doit être installé avec les pattes ou le piédestal fournis, fixés comme indiqué dans les instructions d'installation.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
- Ne pas raccorder cet appareil à une cheminée desservant un autre appareil.
- Pour l'usage avec du combustible solide seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Nc rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu. Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste en une violation de la loi fédérale (USA).

Optional blower: AC02050 (115V, 0.8A, 60Hz)

Option ventilateur: AC02050 (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.  
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 2.4 g/h

Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii)

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.  
(For more information go to www.p65warnings.ca.gov)



## CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

## ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

27734

Made in St-Augustin-de-Desmaures, (Qc), Canada  
20/06/2023 (# Test)



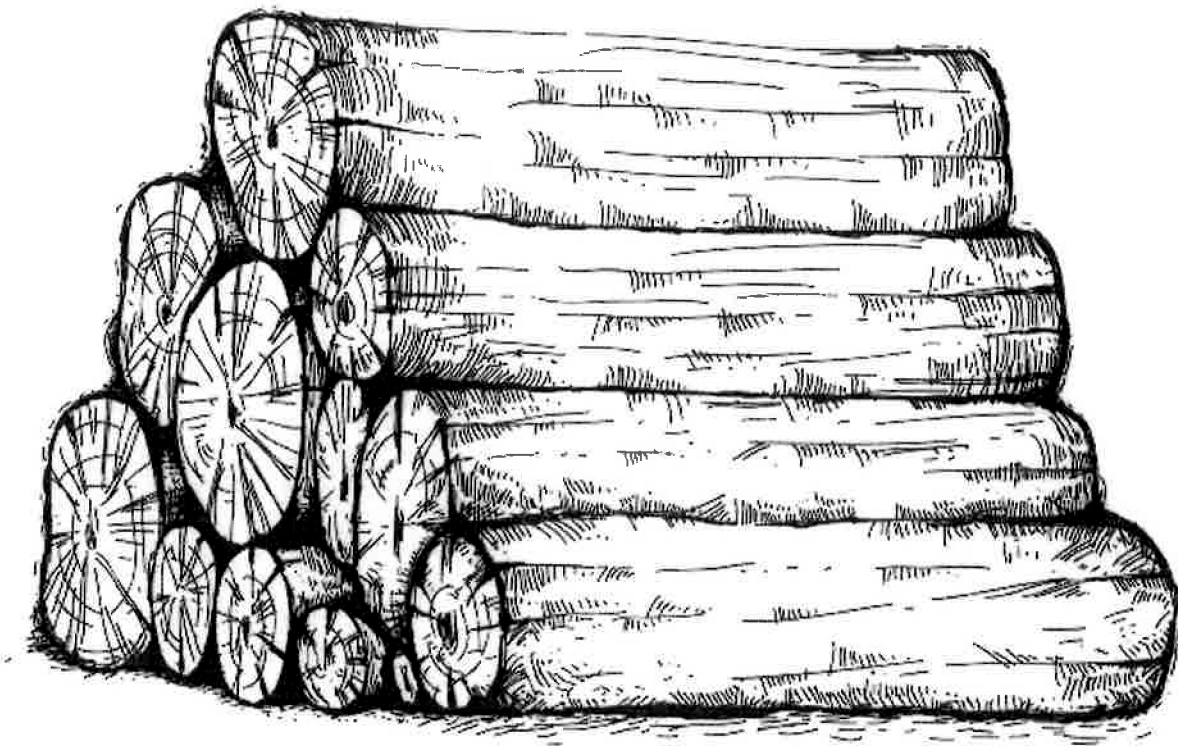
Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures, (Qc), Canada  
20/06/2023 (# Test)

# Wood Stove Owner's Manual

## Part 1 of 2

### SAFETY NOTIFICATIONS AND GENERAL INFORMATION



ENGLISH

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

READ THIS ENTIRE GUIDE BEFORE INSTALLATION AND USE OF THIS WOOD STOVE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

**READ AND KEEP THIS GUIDE FOR REFERENCE**

# THANK YOU FOR CHOOSING THIS WOOD STOVE.

**If this room heater is not properly installed, a house fire may result.**

**To reduce the risk of fire, follow the installation instructions in this manual.**

As one of North America's largest and most respected wood stove and fireplace manufacturers, Stove Builder International takes pride in the quality and performance of all its products.

The following pages provide general advice on wood heating, detailed instructions for safe and effective installation, and guidance on how to get the best performance from this stove.

It is highly recommended that this wood burning hearth product be installed and serviced by professionals who are certified by a «Qualified Agency» such as NFI (National Fireplace Institute®) or CSIA (Chimney Safety Institute of America) in the United States and in Canada by WETT (Wood Energy Technology Transfer) or in Quebec by APC (Association des Professionnels du Chauffage).

Contact local building or fire officials about restrictions and installation inspection requirements in your local area.

A building permit might be required for the installation of this stove and the chimney that it is connected to. It is also highly recommended to inform your home insurance company.

Please read this entire manual before installing and using this stove.

A primary alternative heat source should be available in the home. This heating unit may serve as a supplementary heat source. The manufacturer cannot be responsible for additional heating costs associated with the use of an alternative heat source.



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## 1. Safety Information and Environment

- Some stoves have been tested for use with an open door in conjunction with a fire screen, sold separately (See in the *Wood Stove Installation and Operation Manual* if your appliance has this option). The door may be opened, or fire screen removed only during lighting procedures or reloading. Always close the door or put back on the fire screen after ignition. **Do not leave the insert unattended when the door is open with or without a fire screen.**
- **WARNING : OPERATE ONLY WITH THE DOOR FULLY CLOSED OR FULLY OPEN WITH THE FIRE SCREEN IN PLACE. IF THE DOOR IS LEFT PARTLY OPEN, GAS AND FLAME MAY BE DRAWN OUT OF THE OPENING, CREATING RISKS FROM BOTH FIRE AND SMOKE.**
- **WARNING: ALWAYS OPERATE THE STOVE WITH THE ASH DRAWER CLOSED.**
- **HOT WHILE IN OPERATION, KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. GLOVES MAY BE NEEDED FOR THE STOVE OPERATION.**
- Using a stove with cracked or broken components, such as glass, firebricks or baffle may produce an unsafe condition and may damage the stove.
- Open the air control fully before opening the loading door.
- **DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTA OR ENGINE OIL.**
- Do not store fuel within heater minimum installation clearances.
- Burn only seasoned natural firewood.
- This appliance should always be maintained and operated in accordance with these instructions.
- Do not elevate the fire by using a grate.
- Do not use makeshift materials or make any compromises when installing this appliance.
- This wood heater needs periodic inspection and repairs for the proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this guide.
- A smoke detector, a carbon monoxide detector and a fire extinguisher should be installed in the house. The location of the fire extinguisher should be known by all family members.
- A smoke detector located in the proximity of the stove may be activated when the door of the stove is open to reload or to stir.



This product can expose you to chemicals including carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to [www.P65warnings.ca.gov/](http://www.P65warnings.ca.gov/)

- The information given on the certification label affixed to the appliance always overrides the information published, in any other media (owner's manual, catalogues, flyers, magazines and web sites).

- Mixing of appliance components from different sources or modifying components may result in hazardous conditions. Where any such changes are planned, Stove Builder International Inc. should be contacted in advance.
- Any modification of the appliance that has not been approved in writing by the testing authority violates CSA-B365 (Canada), and ANSI NFPA 211 (USA).
- **CAUTION: DO NOT CONNECT TO OR USE IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCTWORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATION.**
- **CAUTION: DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.**
- Connect this stove only to a listed factory-built chimney for use with solid fuel or to a lined masonry chimney conforming to national and local building codes.
- If required, a supply of combustion air shall be provided to the room.
- This stove must be installed as a free-standing heater with the clearances listed in the manufacturer's installation instructions. It is strictly forbidden to install this stove in a factory-built fireplace.
- **NOTE: DO NOT INSTALL THE CHIMNEY DIRECTLY AT THE OUTLET OF THE APPLIANCE. A CHIMNEY CONNECTOR (FLUE PIPE) IS REQUIRED UNLESS THE APPLIANCE IS SPECIFICALLY APPROVED FOR THAT TYPE OF INSTALLATION.**

## 1.1 Mobile Home

- Some appliances may be installed in a mobile home. The installation requires a fresh air kit, sold separately.
- **WARNING : DO NOT INSTALL IN THE SLEEPING ROOM OF A MOBILE HOME.**
- **IF INSTALLATION OF THIS PRODUCT IS PERMITTED IN A MOBILE HOME, IT MUST BE SECURED TO THE STRUCTURE.**
- **CAUTION : WHEN THE INSTALLATION IN A MOBILE HOME IS ACCEPTED, THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, CEILING AND ROOF MUST BE MAINTAINED.**
- **IT IS PROHIBITED TO USE THIS WOOD STOVE WITH A FIRE SCREEN IN A MOBILE HOME.**

## 1.2 Regulations Covering Stove Installation

When installed and operated as described in these instructions, this wood stove is suitable for use as a freestanding heater in residential installations.

In Canada, the CSA-B365 *Installation Code for Solid Fuel Burning Appliances and Equipment* and the CSA-C22.1 *Canadian National Electrical Code* are to be followed in the absence of local code requirements. In the USA, the ANSI NFPA 211 *Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances* and the ANSI NFPA 70 *National Electrical Code* are to be followed in the absence of local code requirements.

This stove must be connected to a chimney complying with the requirements for Type HT chimneys in the *Standard for Factory-Built Chimneys for Residential Type and Building Heating Appliances*, UL 103HT and ULC S629 or to a code-approved masonry chimney with a flue liner.

## 1.3 Location of the Certification Label

Since the information given on the certification label affixed to the appliance always overrides the information published, in any other media (owner's manual, catalogues, flyers, magazines and web sites) it is important to refer to it in order to have a safe and compliant installation. In addition, important information about the stove can be found (model, serial number, etc.). The certification label is located on the back of the stove.

It is recommended to note the stove serial number on page 1 of the *Wood Stove Installation and Operation Manual* since it will be needed to precisely identify the version of the appliance in the event replacement parts or technical assistance is required.

## 1.4 Emissions and Efficiency

The low smoke emissions produced by the special features inside this stove firebox mean that the household will release up to 90% less smoke into the outside environment than if an older conventional stove was used. But there is more to the emission control technologies than protecting the environment.

The smoke released from wood when it is heated contains about half of the energy content of the fuel. By burning the wood completely, this stove releases all the heat energy from the wood instead of wasting it as smoke up the chimney. Also, the features inside the firebox allow control of the air supply meaning controlling the heat output, while maintaining clean and efficient flaming combustion, which boosts the efficient delivery of heat to the home.

The emission control and advanced combustion features of this stove can only work properly if the fuel used is in the correct moisture content range of 15% to 20%. Refer to the [Fuel Section](#) for suggestions on preparing fuelwood and judging its moisture.

## 1.5 Materials

The SBI team is committed to protecting the environment, so they do everything they can to use only materials in their products that will have no lasting negative impact on the environment.

The **body** of this stove, which is most of its weight, is carbon steel. Should it ever become necessary many years in the future, almost the entire stove can be recycled into new products, thus eliminating the need to mine new materials.

The **paint** coating on the stove is very thin. Its VOC content (Volatile Organic Compounds) is very low. VOCs can be responsible for smog, so all the paint used during the manufacturing process meets the latest air quality requirements regarding VOC reduction or elimination.

The **air tubes** are stainless steel, which can also be recycled.

The **baffle** is made of aluminosilicate fibre material that is compressed with a binder to form a rigid board. C-Cast or Vermiculite can withstand temperatures above 2,000 °F. It is not considered hazardous waste. Disposal at a ecocenter is recommended.

The **Grey firebrick** is made of cement and pumice stone. Pumice stone is made from volcanic rock. It is recommended to send it to the ecocenter.

The **Yellow firebrick** is mainly composed of silicon dioxide, also known as silica, a product processed from a mined mineral. It is most commonly found in nature in the form of sand and clay. Disposal at a ecocenter is recommended.

The door and glass **gaskets** are fibreglass which is spun from melted sand. Black gaskets have been dipped into a solvent-free solution. Disposal at a ecocenter is recommended.

The door **glass** is a 5/32" (4 mm) thick ceramic material that contains no toxic chemicals. It is made of natural raw materials such as sand and quartz that are combined in such a way to form a high temperature glass. Ceramic glass cannot be recycled in the same way as normal glass, so it should not be disposed of with your regular household products. Disposal at a ecocenter is recommended.

## 2. Fuel

Good firewood has been cut to the correct length for the stove, split to a range of sizes and stacked in the open until its moisture content is down to 15% to 20%.

### **DO NOT BURN:**

- **COAL;**
- **GARBAGE;**
- **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 OR PRESSURE-TREATED WOOD;**
- **MANURE OR ANIMAL REMAINS;**
- **SALT WATER DRIFTWOOD OR OTHER PREVIOUSLY SALT WATER SATURATED MATERIALS;**
- **UNSEASONED WOOD; OR**
- **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 AN AFFECTED WOOD HEATER.**
- **BURNING THESE MATERIALS MAY RESULT IN THE RELEASE OF TOXIC FUMES OR RENDER THE HEATER INEFFECTIVE AND CAUSE SMOKE.**
- **IF THESE FUELS ARE BURNED, IT COULD CREATE A HIGHER CONCENTRATION OF CO THAN BURNING HARDWOOD.**

### 2.1 Tree Species

The tree species the firewood is produced from is less important than its moisture content. The main difference in firewood from various tree species is the density of the wood. Hardwoods are denser than softwoods.

Homeowners with access to both hardwood and softwood use both types for different purposes.

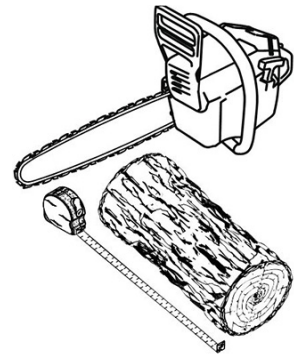
Softer woods make good fuel for mild weather in spring and fall because they light quickly and produce less heat. Softwoods are not as dense as hardwoods so a given volume of wood contains less energy. Using softwoods avoids overheating the house, which can be a common problem with wood heating in moderate weather. Harder woods are best for colder winter weather when more heat and longer burn cycles are desirable.

Note that hardwood trees like oak, maple, ash and beech are slower growing and longer lived

than softer woods like poplar and birch. That makes hardwood trees more valuable. The advice that only hardwoods are good to burn is outdated. Old, leaky cast iron stoves wouldn't hold a fire overnight unless they were fed large pieces of hardwood. That is no longer true.

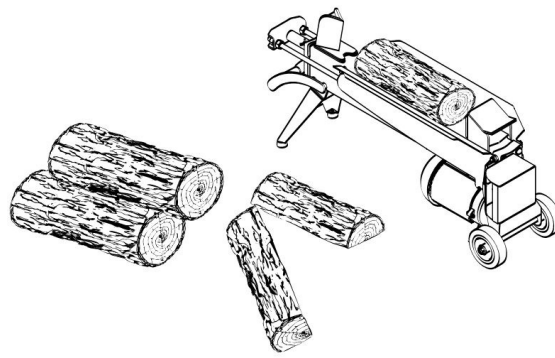
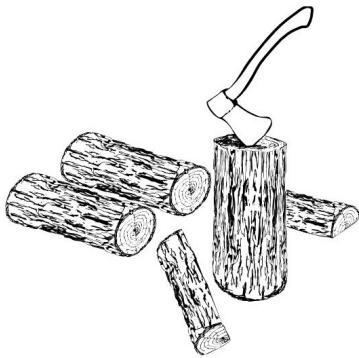
## 2.2 Log Length

Logs should be cut at least 1" (25 mm) shorter than the firebox so they fit in easily. Pieces that are even slightly too long makes loading the stove very difficult. The most common standard length of firewood is 16" (400 mm).



## 2.3 Piece Size

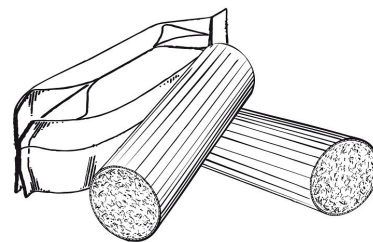
Firewood dries more quickly when it is split. Large unsplit rounds can take years to dry enough to burn. Even when dried, unsplit logs are difficult to ignite because they don't have the sharp edges where the flames first catch.



Wood should be split to a range of sizes, from about 3" to 6" (75 mm to 150 mm) in cross section. Having a range of sizes makes starting and rekindling fires much easier.

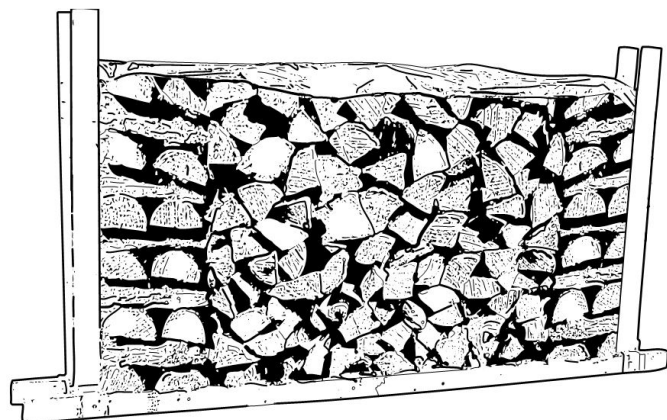
## 2.4 Compressed Wood Logs

Compressed wood logs made of 100% compressed sawdust can be burned with caution in the number of these logs burned at once. Do not burn compressed logs made of wax impregnated sawdust or logs with any chemical additives. Follow the manufacturer's instructions and warnings.



## 2.5 Drying Time

Firewood that is not dry enough to burn is the cause of most complaints about wood burning appliances. Continually burning green or unseasoned wood produces more creosote and involves lack of heat and dirty glass door. Firewood with a moisture content between 15% and 20% will allow the stove to produce its highest possible efficiency.

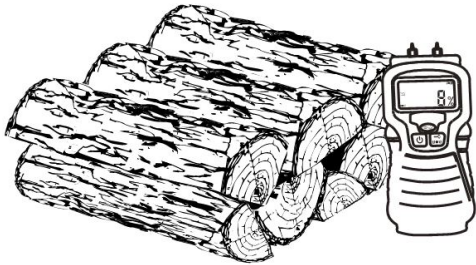




## Here are some facts to consider in estimating drying time:

- Firewood bought from a dealer is rarely dry enough to burn, so it is advisable to buy the wood in spring and dry it yourself;
- Drying happens faster in dry weather than in a damp climate;
- Drying happens faster in warm summer weather than in winter weather;
- Small pieces dry more quickly than large pieces;
- Split pieces dry more quickly than unsplit rounds;
- Softwoods like pine, spruce, poplar, and aspen take less time to dry than hardwoods. they can be dry enough to burn after being stacked to air dry only for the summer months;
- Hardwoods like oak, maple and ash can take one, or even two years to dry fully, especially if the pieces are big;
- Firewood dries more quickly when stacked outside in a location exposed to sun and wind; it takes much longer to dry when stacked in a wood shed;

## Use these guidelines to find out if the firewood is dry enough to burn:



- Cracks form at the ends of logs as they dry;
- The wood turns from white or cream colored to grey or yellow;
- Two pieces of wood struck together sounds hollow;
- Dry wood is much lighter in weight than wet wood,
- The face of a fresh cut feels warm and dry;
- The moisture content read by a moisture meter is between 15% to 20%.

## 3. Burning Wood Efficiently

### 3.1 First Use

Two things happen when burning the first few fires; the paint cures and the internal components are conditioned. As the paint cures, some of the chemicals vaporize. The vapors are not poisonous, but they smell bad. Fresh paint fumes can also trigger false alarms in smoke detectors. When lighting the heater for the first few times, it may be wise to open doors and windows to ventilate the house.

Burn two or three small fires to begin the curing and conditioning process. Then build bigger and hotter fires until there is no longer paint smell from the stove. As hotter and hotter fires are burned, more of the painted surfaces reach the curing temperature of the paint. The smell of curing paint does not disappear until one or two very hot fires have been burned.

**Never built the fire too close to the glass. It may cause higher temperature and produce a faster aging of the glass.**

## 3.2 Lighting Fires

Each person heating with wood develops its own favorite way to light fires. Regardless of the method chosen, the goal should be to have a hot fire burning, quickly. A fire that ignites fast produces less smoke and deposits less creosote in the chimney.



**Never use gasoline, gasoline-type lantern fuel (naphtha), fuel oil, motor oil, kerosene, charcoal lighter fluid, or similar liquids or aerosols to start or 'freshen up' a fire in this wood stove. Keep all such liquids well away from the stove while it is in use.**

**Here are three popular and effective ways to ignite wood fires.**

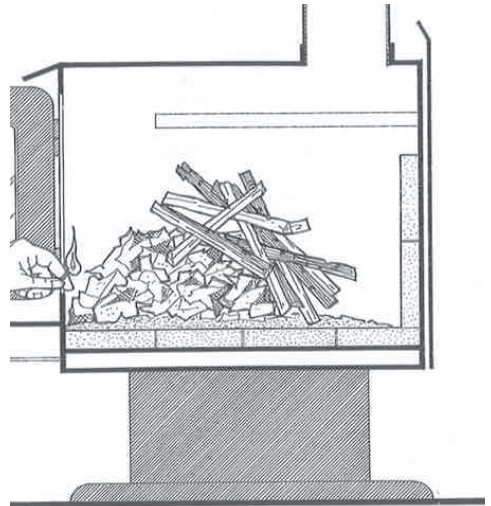
### 3.2.1 Conventional Method

The conventional method to build a wood fire is to crumple 5 to 10 sheets of newspaper and place them in the firebox and hold them in place with ten pieces of kindling wood. The kindling should be placed on and behind the newspaper.

Then add two or three small pieces of firewood. Open the air intake control completely and ignite the newspaper. Leave the door slightly ajar.

Once the fire has ignited, the door can be closed with the air control still fully open. When the kindling is almost completely burned, standard firewood pieces can be added.

**Do not leave the heater unattended when the door is slightly open. Always close and latch the door after the fire ignites.**



### 3.2.2 The Top Down Method

This method is the opposite of the conventional method and only works properly if well-seasoned wood is used.

Place three or four small, split, dry logs in the firebox. Arrange the kindling wood on the logs in two layers at right angles and place a dozen finely split kindling on the second row.

It is possible to use ragged paper but it may not hold in place since it tends to roll while it is burning. The best is to wrap a sheet on itself, grab the ends of the roll and make a knot. Use four or five sheets of paper tied together and put them on top and around the kindling. Open the air intake control completely, ignite the paper and close the door.

The top down fire method has two advantages over the traditional method: first, the fire does not collapse on itself, and it is not necessary to add wood gradually since the combustion chamber is full before the fire is lit.

### 3.2.3 Two Parallel Logs Method

Two spit logs are placed in the firebox with a few sheets of twisted newspapers in between the logs. Fine kindling is added across the two logs and some larger kindling across those, log cabin style. Newspaper is lit.

### 3.2.4 Using Fire Starters

Commercial fire starters can be used instead of a newspaper. Always follow the instructions on the packaging before use.

**DO NOT USE CHEMICALS OR FLUID TO START THE FIRE.**

**NEVER USE GEL STARTER IF THERE ARE HOT EMBERS INSIDE THE FIREBOX. THE BOTTLE OF GEL WILL CATCH ON FIRE.**

## 3.3 Zone Heating

This stove is a space heater, which means it is intended to heat the area it is installed in, as well as spaces that connect to that area, although to a lower temperature. This is called zone heating and it is an increasingly popular way to heat homes or spaces within homes.

Zone heating can be used to supplement another heating system by heating a particular space within a home, such as a basement, a family room or an addition that lacks another heat source.

Houses of moderate size and relatively new construction can be heated with a properly sized and located wood stove. Whole house zone heating works best when the stove is in the part of the house where the family spends most of its time. This is normally the main living area where the kitchen, dining and living rooms are located.

Locating the stove in this area will give the maximum benefit of the heat it produces and will achieve the highest possible heating efficiency and comfort. The space where the most time is spent will be warmest, while bedrooms and basement (if there is one) will stay cooler. In this way, less wood is burnt than with other forms of heating.

Although the stove may be able to heat the main living areas of the house to an adequate temperature, it is strongly recommended to also have a conventional oil, gas or electric heating system to provide backup heating.

The success of zone heating will depend on several factors, including the correct sizing and location of the stove, the size, layout and age of your home and your climate zone. Three-season vacation homes can usually be heated with smaller stoves than houses that are heated all winter.

## 3.4 Combustion Cycles

Wood heating with a space heater is very different than other forms of heating. There will be temperature variations in different parts of the house and there will be temperature variations throughout day and night. This is normal, and for experienced wood burners these are advantages of zone heating wood burning.

Wood heaters don't have a steady heat output. It is normal for the temperature to rise after a new load of wood is ignited and for its temperature to gradually decrease throughout the burning cycle. This increasing and decreasing temperature can be matched with the household routines. For example, the temperature in the area can be cooler when the household is active, and it can be warmer when it is inactive.

Wood burns best in cycles. A cycle starts when a new load of wood is ignited by hot coals and

ends when that load has been consumed down to a bed of charcoal about the same size as it was when the wood was loaded.

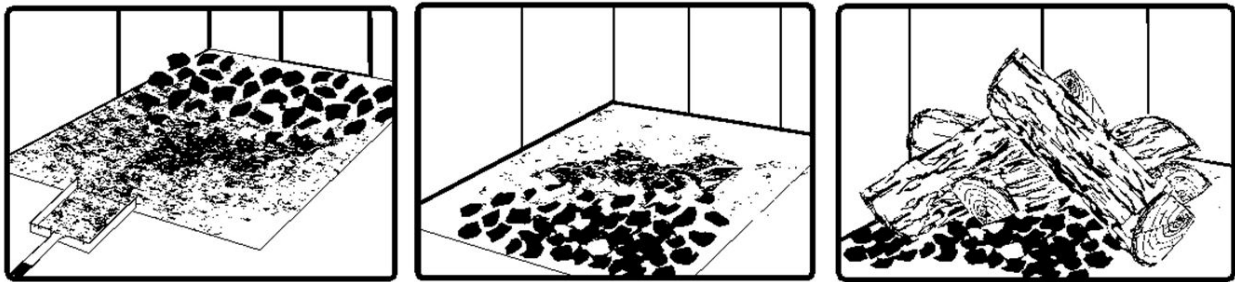
Trying to produce a steady heat output by placing a single log on the fire at regular intervals is not recommended. Always place at least three, and preferably more pieces on the fire at a time so that the heat radiated from one piece helps to ignite the pieces next to it. Each load of wood should provide several hours of heating. The size of each load may vary depending on the amount of heat required.

Burning in cycles means the loading door does not need to be opened while the wood is flaming. This is an advantage since it is preventing smoke leaking from the heater when the door is opened as a full fire is burning. This is especially true if the chimney is on the outside wall of the house.

**If the door must be opened while the fire is flaming, fully open air control for a few minutes then open the door slowly.**

### 3.5 Rekindling a Fire

When the temperature of the room is lower and all that remains is embers, it is time to reload. Remove excess ash from the front of the firebox and bring the ashes forward. Place a new load of wood on, and at the back of the embers. Open the air control completely and close the door.



Raking the coals is useful for two reasons. First, it brings them near where most of the combustion air enters the firebox. This will ignite the new load quickly. Secondly, the charcoal will not be smothered by the new load of wood. When the embers are simply spread inside the combustion chamber, the new load smoulder for a long time before igniting.

Close the air control only when the firebox is full of bright turbulent flames, the wood is charred, and its edges are glowing.

*The heater should not be left unattended during ignition and the fire should not burn at full intensity for more than a few minutes.*

When lighting a new load, the appliance produces a heat surge. This heat surge is pleasant when the room temperature is cool but can be unpleasant when the room is already warm. Therefore, it is best to let each load of wood burn completely so that the room cools down before putting a load of wood back on.

Do not overfire the unit. The signs of an overfired unit are a roaring fire, the chimney connector is glowing red and an extreme heat coming from the cookstove. If this occurs, **DO NOT OPEN THE DOOR**. Shut-off the air inlet opening completely and wait until the glow has completely subsided.

### 3.6 Removing Ashes

Ash should be removed from the firebox every two to three days of full time heating. Ash should not accumulate excessively in the firebox since it will affect the proper operation of the appliance. The best time to remove ash is in the morning, after an overnight fire when the heater is relatively cold, but there is still a little chimney draft to draw the ash dust into the heater and prevent going out into the room.

Ashes almost always contain live embers that can stay hot for days and which release carbon monoxide gas. Ashes should be placed in a tightly covered metal container. The container must be placed on a non-combustible floor or on the ground well away from all combustible materials.

If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be kept in a closed metal container until they are completely cooled. No other waste should be placed in this container.



**NEVER STORE ASHES INDOORS OR IN A NON-METALLIC CONTAINER OR ON A WOODEN DECK.**

### 3.7 Air Intake Control

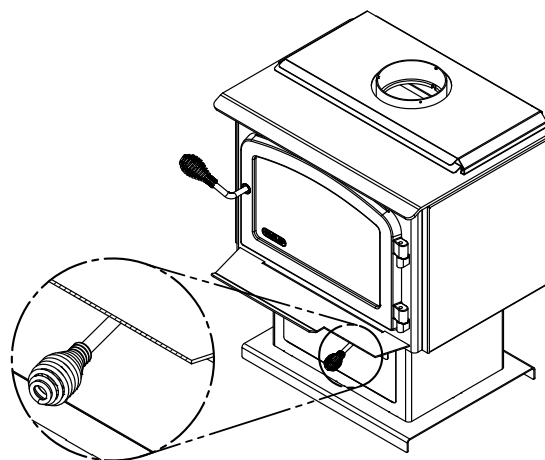
Once the firewood, firebox and chimney are hot, air intake can be reduced to achieve a steady burn.

As the air intake is reduced, the burn rate decreases. This has the effect of distributing the thermal energy of the fuel over a longer period of time. In addition, the flow rate of exhaust through the appliance and flue pipe slows down, which increases the duration of the energy transfer of the exhaust gases. As the air intake is reduced, the flame slows down.

If the flames diminish to the point of disappearing, the air intake has been reduced too early in the combustion cycle or the wood used is too wet. If the wood is dry and the air control is used properly, the flames should decrease, but remain bright and stable.

On the other hand, too much air can make the fire uncontrollable, creating very high temperatures in the unit as well as in the chimney and seriously damaging them. A reddish glow on the unit and on the chimney components indicates overheating. Excessive temperatures can cause a chimney fire.

The images shown are for guidance only and may differ from your product, but the operation remains the same. See the [EPA Loading Section](#) of the [Wood Stove Installation and Operation Manual](#) for a specific overview of the air control of your appliance.



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## 3.8 Fire Types

Using the air intake control is not the only way to match the appliance heat output to the desired temperature in the house. A house will need far less heating in October than in January to maintain a comfortable temperature. Filling the firebox full in fall weather will overheat the space. Otherwise, the combustion rate will have to be reduced to a minimum and the fire will be smoky and inefficient. Here are some suggestions for building fires suitable for different heating needs. The method used to certify your appliance according to EPA Standards is presented in the [EPA Loading Section](#) of the *Wood Stove Installation and Operation Manual* of your appliance.

### 3.8.1 Flash Fire

To build a small fire that will produce a low heat output, use small pieces of firewood and load them crisscross in the firebox. The pieces should only be 3» to 4» in diameter. After raking the coals, lay two pieces parallel to each other diagonally in the firebox and lay two more across them in the other direction. Open the air control fully and only reduce the air after the wood is fully flaming. This kind of fire is good for mild weather and should provide enough heat for up to four hours. Small fires like this are a good time to use softer wood species and avoid overheating the house.

### 3.8.2 Long Lasting Fire

For a fire that will last up to eight hours but will not produce intense heat, use soft wood and place the logs compactly in the firebox. Before reducing the air intake, the load will have to burn at full heat for long enough for charring the surface of the logs. The flame must be bright before letting the fire burn by itself.

### 3.8.3 High Output Fires

When heating needs are high during cold weather, the fire should burn steadily and brightly. This is the time to use larger pieces of hardwood. Place the biggest pieces at the back of the firebox and place the rest of the pieces compactly. A densely built fire like this will produce the longest combustion this stove is capable of.

Special attention must be paid when building fires like this since if the air intake is reduced too quickly, the fire could smoulder. The wood must be flaming brightly before leaving the fire to burn.

### 3.8.4 Burn Cycle Time

The burn cycle time is the period between loading wood on a coal bed and the consumption of that wood back to a coal bed of the same size. The flaming phase of the fire lasts for roughly the first half of the burn cycle and the second half is the coal bed phase during which there is little or no flame. The burning time expected from this stove, including both phases, will vary depending on a number of things, such as:

- firebox size,
- the amount of wood loaded,
- the species of wood,
- the wood moisture content,
- the size of the space to be heated,
- the climate zone where the house is, and
- the time of the year.

The table below gives an approximate maximum burn cycle time, based on firebox volume.

**Table 1 : Approximate Maximum Burn Cycle Time**

<b>FIREBOX VOLUME</b>	<b>MAXIMUM BURN CYCLE TIME</b>
<1.5 cubic feet	3 to 5 hours
1.5 c.f. to 2.0 c.f.	5 to 6 hours
2.0 c.f. to 2.5 c.f.	6 to 8 hours
2.5 c.f. to 3.0 c.f.	8 to 9 hours
>3.0 c.f.	9 to 10 hours

A longer burning time is not necessarily an indication of efficient operation. It is preferable to build a smaller fire that will provide three or four hours of heating than to fully load the firebox for a much longer burn. Shorter burn cycles make it easier to match the heat output of the stove to heat demand for the space.

### **3.8.5 Logs Orientation**

In a relatively square firebox, the wood can be loaded north-south (ends of the logs visible) or east-west (sides of the logs visible).

North-south loads allow more wood to be loaded at the same time. On the other hand, they break into smaller pieces faster. North-south loading is good for high output, long lasting fires for cold weather.

East-west loads allow a limited amount of wood since too many logs could cause them to fall on the glass. East-west loads, placed in a compact way, take a long time before breaking down. They are excellent for low-intensity, long-lasting fires in relatively mild weather.

### **3.8.6 Carbon Monoxide**

Carbon monoxide is an odourless gas that is highly toxic which can cause death at high concentration in air. Installation of a carbon monoxide detector is highly recommended.

When unburned logs remain in the firebox and the flame disappears, go outside and look at the chimney exit. If there is visible smoke, it means that there is still combustible to burn but that the fire lacks air to burn properly. In this situation, the CO rate will increase so it is important to react. Open the door slightly and move the log with a poker. Turn it over and create a passage for the air below, making a trench with the coal bed. Add small pieces of wood to restart the combustion.

## **4. Maintenance**

This heater will give many years of reliable service if used and maintained properly. Internal components of the firebox such as firebricks or refractory panels, baffle and air tubes will wear over time. Defective parts should always be replaced with original parts (see « Exploded diagram and parts list » in the *Wood Stove Installation and Operation Manual*).

To avoid premature deterioration, follow the lighting and reloading procedures in section "[3. Burning Wood Efficiently](#)" and also avoid letting the heater run with the air intake fully open for entire burn cycles.

## 4.1 Heater

### 4.1.1 Cleaning and Painting

Painted and plated surfaces can be wiped down with a soft, damp cloth. If the paint is scratched or damaged, it is possible to repaint the heater with a heat-resistant paint (see « Exploded diagram and parts list » in the *Wood Stove Installation and Operation Manual*). **Do not clean or paint the appliance when it is hot.** Before painting, the surface should be sanded lightly with sandpaper and then wiped off to remove dust. Apply two thin layers of paint.

## 4.2 Refractory Materials and Baffle

Inspect the firebricks or the refractory panels and the baffle for damage periodically and replace anything that is broken.

*Operation of the heater with a cracked or missing baffle may cause unsafe temperatures and hazardous conditions and will void the warranty.*

## 4.3 Glass Door

### 4.3.1 Cleaning

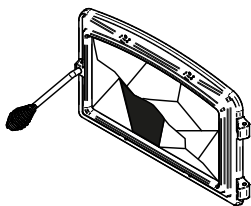
Under normal conditions, the door glass should stay relatively clear. If the firewood is dry enough and the operating instructions in this guide are followed, a whitish, dusty deposit will form on the inner surface of the glass after a week or so of use. This is normal and can be easily removed when the heater is cold by wiping with a damp cloth or paper towel and then drying.

When the stove runs at a low combustion rate, light brown stains may form, especially in the lower corners of the glass. This indicates that the fire has been smoky and some of the smoke has condensed on the glass. It also indicates incomplete combustion of the wood, which also means more smoke emissions and faster formation of creosote in the chimney.

The deposits that form on the glass are the best indication of the fuel quality and success in properly using the stove. These stains can be cleaned with a special wood stove glass cleaner. **Do not use abrasive products to clean the glass.**

The goal should be having a clear glass with no brown stains. If brown stains appear regularly on the glass, something about the fuel or the operating procedure needs to be changed. When brown streaks are coming from the edge of the glass, it is time to replace the gasket around the glass.

The glass gasket should be self-adhesive. Always replace the gasket with a genuine one.



**Do not clean the glass when the stove is hot.**

**Do not abuse the glass door by striking or slamming shut.**

**Do not use the stove if the glass is broken.**



### 4.3.2 Replacement

In case of breakage or change of wearing parts, refer to the *Wood Stove Installation and Operation Manual*.

## 5. Operating the Stove

**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 guide.**

- Before using the stove, a pedestal base or leg kit must be installed under the product, if this is not already the case. Refer to the *Wood Stove Installation and Operation Manual*.
- The installation of the options is optional, see the *Wood Stove Installation and Operation Manual* for the available options and their installation.

### 5.1 Blower Operation

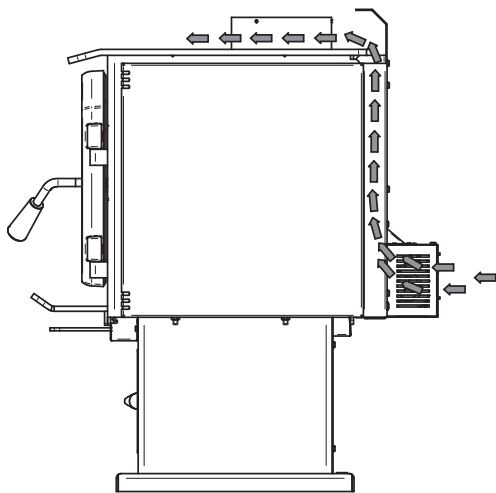


Figure 1: Air flow with a blower

It is possible, on wood stoves, to install a fan (depending on your product, it could be included or sold separately). See the Exploded View and Parts List in the *Wood Stove Installation and Operation Manual* for the original part number.

The blower is installed on the back of the stove to increase the airflow through the heat exchanger and improve hot air circulation in the room. When used regularly, the blower can provide a small increase in efficiency, up to 2%. However, the use of a blower should not be used as a way to gain more output from a stove that is undersized for the space it is intended to heat.



Ensure the blower cord is not in contact with any surface of the stove to prevent electrical shock or fire damage. Do not run cord beneath the stove.

The blower has a rheostat that can be adjusted in three different positions; either from high (HI) to low (LO) or closed (OFF).

Allow the stove to reach operating temperature (approximately one hour) before turning on the blower, since increased airflow from the blower will remove heat and affect the start up combustion efficiency.

It is possible to add a heat sensor, sold separately, to the blower. When the blower is ON, the blower will start automatically when the stove is hot enough and it will stop when the stove has cooled down. Therefore, you can leave the blower speed control at the desired setting.

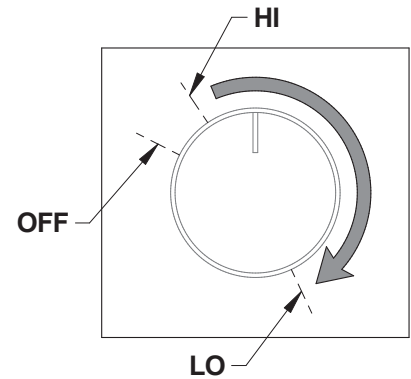


Figure 2: Blower operation

## 5.2 The Use of a Fire Screen

Some stoves have been tested for use with an open door in conjunction with a fire screen (**In the United States or in provinces with a particulate matter emission rate limit (e.g. US EPA), the use of wood stoves with door open with a fire screen is prohibited**), this option is sold separately (to confirm that your product has been tested with it, please refer to the Wood Stove Installation and Operation Manual). If applicable on your model, the fire screen must be properly secured on the stove to avoid any risk of sparks damaging the flooring. When the fire screen is in use, do not leave the stove unattended to respond promptly in the event of smoke spillage into the room. Potential causes of smoke spillage are described in Section "The venting system" of this guide. See "Optional Fire Screen Installation" in the *Wood Stove Installation and Operation Manual* for specifications about installation instructions.

**OPERATING THE STOVE WITH A FIRE SCREEN INCREASES POSSIBILITIES OF GENERATING CARBON MONOXIDE. CARBON MONOXIDE IS AN ODOURLESS GAS THAT IS HIGHLY TOXIC WHICH CAN CAUSE DEATH AT HIGH CONCENTRATION IN AIR.**

## 5.3 Exhaust System

Wood smoke can condense inside the chimney, forming a flammable deposit called creosote. If creosote builds up in the system, it can ignite when a hot fire is burned in the stove. A very hot fire can progress to the top of the chimney. Severe chimney fires can damage even the best chimneys. Smouldering, smoky fires can quickly cause a thick layer of creosote to form. When the stove is operated properly, the exhaust from the chimney is mostly clear and creosote builds up more slowly.

### «Creosote - Formation and Need to Removal

*When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cooler chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes 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 a creosote buildup has occurred.*

*The presence in a chimney of soot or creosote in excess of 1/8" (3 mm) thick will indicate*

*the need for immediate cleaning, possible modification of burning procedures, and more frequent inspections. If creosote has accumulated it should be removed to reduce the risk of a chimney fire.»*

### 5.3.1 Cleaning Frequency

It is not possible to predict how much or how quickly creosote will form in the chimney. It is important, therefore, to check the build-up in the chimney monthly until the rate of creosote formation is determined. Even if creosote forms slowly in the system, the chimney should be cleaned and inspected at least once each year.

Establish a routine for the fuel, wood stove and firing technique. Check daily for creosote build-up until experience shows how often you need to clean to be safe. Be aware that the hotter the fire the less creosote is deposited, and weekly cleaning may be necessary in mild weather even though monthly cleaning may be enough in the coldest months.

Contact your local municipal or provincial fire authority for information on how to handle a chimney fire. Have a clearly understood plan to handle a chimney fire.

### 5.3.2 Sweeping the Chimney

Chimney sweeping can be a difficult and dangerous job. People with no chimney sweeping experience will often prefer to hire a professional chimney sweep to inspect and clean the system for the first time. After seeing the cleaning process, some will choose to do it themselves.

The chimney should be checked regularly for creosote build-up. Inspection and cleaning of the chimney can be facilitated by removing the baffle. See "Air Tubes and Baffle Installation" in the *Wood Stove Installation and Operation Manual* for more details.



### 5.3.3 Chimney Fire

Regular chimney maintenance and inspection can prevent chimney fires. If you have a chimney fire, follow these steps:

1. Close the stove door and the air intake control;
2. Alert the occupants of the house of the possible danger;
3. If you require assistance, alert the fire department;
4. If possible, use a dry chemical fire extinguisher, baking soda or sand to control the fire. Do not use water as it may cause a dangerous steam explosion;

**Do not use the appliance again until the stove and its chimney have been inspected by a qualified chimney sweep or a fire department inspector.**

## 6. The Venting System

### 6.1 General

The venting system, made of the chimney and the connecting pipe between the stove and the chimney, acts as the engine that drives the wood heating system. Even the best stove will not function safely and efficiently if it is not connected to a suitable chimney.

The heat in the flue gases that pass from the stove and chimney connector into the chimney is not waste heat. This heat is what the chimney uses to make the draft that draws in combustion air, keeps smoke inside the stove and safely vents exhaust to outside. The heat in the flue gas can be seen as the fuel the chimney uses to create draft.

### 6.2 Suitable Chimneys

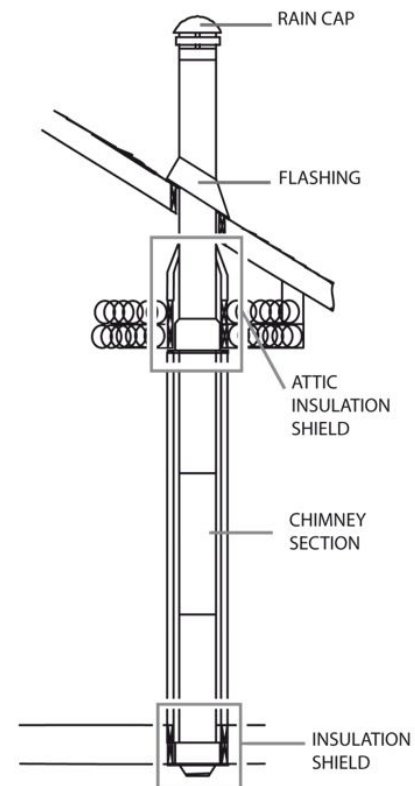
This stove will provide optimum efficiency and performance when connected to a 6" diameter chimney flue system. The connection to a chimney having a diameter of at least 5" (Canada only) or no more than 7" is permitted, if it allows the proper venting of combustion gases and that such application is verified and authorized by a qualified installer. Otherwise, the diameter of the flue should be 6".

To be suitable, a factory-built metal chimney must comply with UL 103 HT (U.S.A.) or ULC S629 (Canada).

### 6.3 Factory-Built Metal Chimneys

These are sometimes referred to as 'high temp' chimneys because they have the specific characteristics to withstand temperatures that can be created by wood burning stoves. Factory-built chimneys are tested as a system with all the necessary components for installation. The instructions provided with the chimney by its manufacturer are the only reliable source of installation guidelines. To be safe and effective, the chimney must be installed exactly in accordance with the manufacturer's instructions. Only components intended for the brand and model of chimney should be used. Never fabricate or substitute parts from other chimney brands. The chimney must be a type suitable for solid fuel.

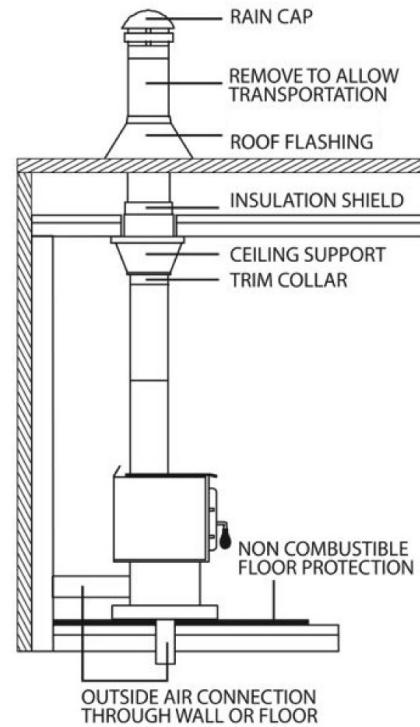
To maintain an effective vapour barrier, insulation and waterproof at the chimney and outside flue pipe, a roof flashing must be installed and sealed with silicone adhesive.



### 6.3.1 Factory-Built Metal Chimneys in Mobile Homes

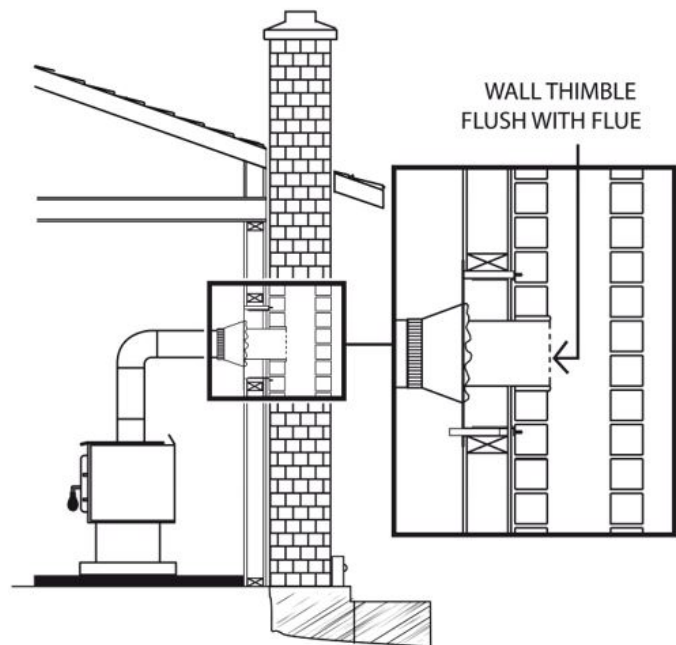
For use in a mobile home (if allowed), this stove is to be connected to a 6" double wall factory built chimney pipe conforming to ULC-S629 or UL 103HT standards for 650°C Factory-built chimney. The total length of the flue system should be at least 12 feet including elbows, from the top of the stove.

To maintain an effective vapour barrier, insulation and waterproof at the chimney and outside flue pipe, a roof flashing must be installed and sealed with silicone adhesive.



### 6.3.2 Masonry Chimneys

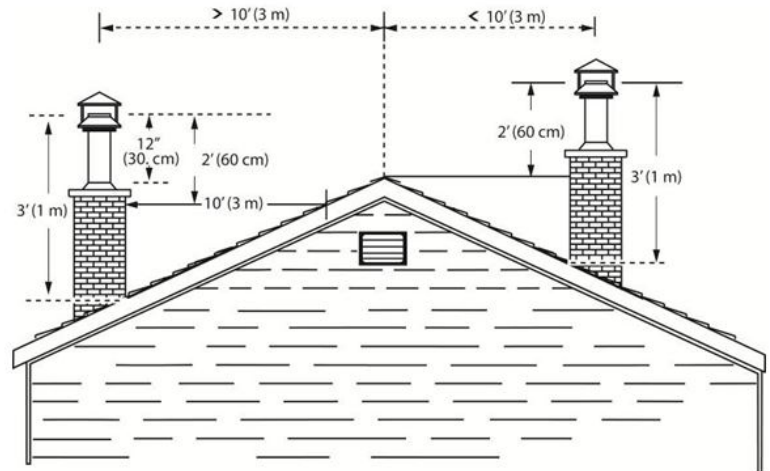
The stove may also be connected to a masonry chimney, provided the chimney complies with the construction rules found in the building code enforced locally. The chimney must have either a clay liner or a suitably listed stainless steel liner. If the masonry chimney has a square or rectangular liner that is larger in cross-sectional area than a round 6" flue, it should be relined with a suitably listed 6" stainless steel liner. Do not downsize the flue to less than 6" unless the venting system is straight and exceeds 25 feet in height. When passing through a combustible wall, the use of an insulated listed thimble is required.



ENGLISH

## 6.4 Minimum Chimney Height

The top of the chimney should be tall enough to be above the air turbulence caused when wind blows against the house and its roof. The chimney must extend at least 3 ft. (1 m) above the highest point of contact with the roof, and at least 2 ft. (60 cm) higher than any roof line or obstacle within a horizontal distance of 10 ft. (3 m).



## 6.5 Chimney Location

Because the venting system is the engine that drives the wood heating system, it must have the right characteristics. The signs of bad system design are cold back drafting when there is no fire in the stove, slow kindling of new fires, and smoke roll-out when the door is opened for loading. There are two guidelines to follow. First, the chimney should be installed up through the heated space of the house, not out and up an outside wall. Second, the chimney should penetrate to the top of the building at or near the highest heated space.

Venting systems that rise straight up from the stove flue collar provide the best performance. Chimneys that rise inside the warm space of the house tend to provide a small amount of draft even when there is no fire burning. This means that when a fire is lit, the smoke goes up the chimney and strong draft build quickly as the chimney flue warms up. Although they are common in North America, chimneys that exit a house wall and run up outside can cause problems.

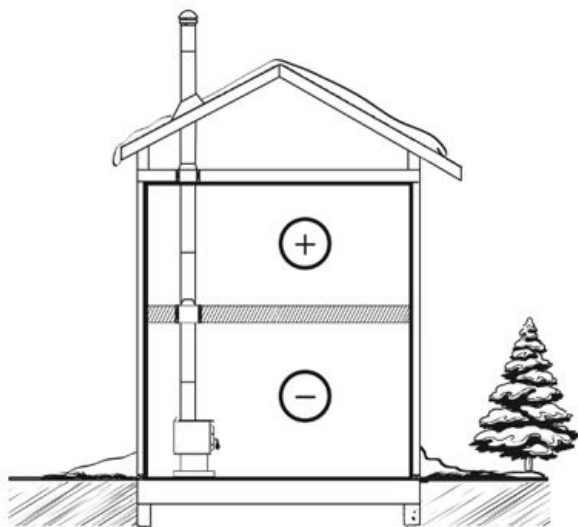


Figure 3: Good System Design

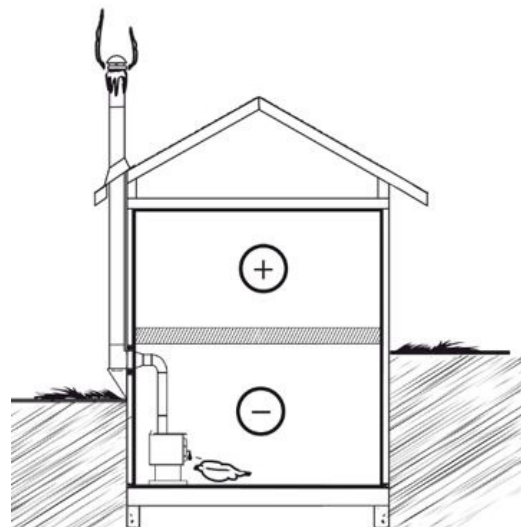
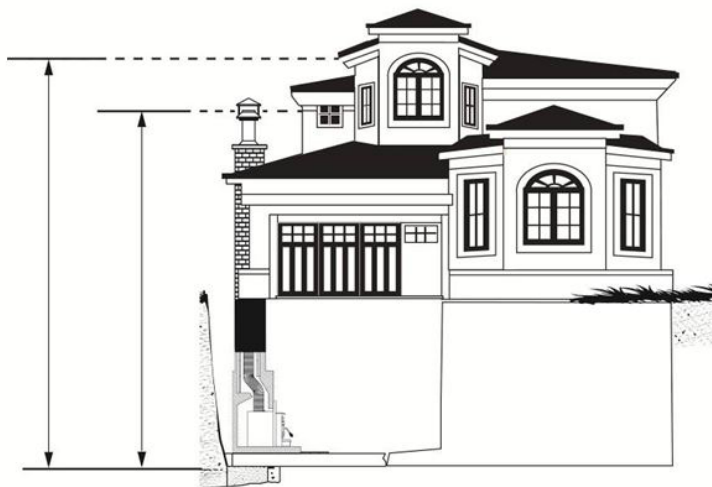


Figure 4: Inferior System Design

When it is cold outside, the warm air in the house is buoyant so it tends to rise. This creates a slight pressure difference in the house. Called 'stack effect', it produces a slightly negative pressure in the lower part of the house (compared to the outside) and a slightly positive pressure zone in the high part of the house. If there is no fire burning in a heater connected to a chimney that is shorter than the warm space inside the house, the slight negative pressure in the lower part of the house will compete against the desired upward flow in the chimney. This occurs for the two following reasons:

First, the chimney runs up the outside of the house, so the air in it is colder and denser than the warm air in the house. And second, the chimney is shorter than the heated space of the house, meaning the negative pressure in the lower part of the house will draw cold air down the chimney, through the stove and into the room. Even the finest stove will not work well when connected to this chimney.



## 6.6 Supply of Combustion Air

For the stove draft to work correctly, the room must have an outside or fresh air inlet, with a minimum of 5" diameter, from the house exterior to the room, that is at least sufficient to replenish the volume of air that comes out of the chimney flue. In well insulated houses an air inlet must be fitted through the outer wall that is not exposed to the prevailing winds, depending on the surrounding conditions of the house. If a vent is installed, it must be fitted in such a way that it cannot be blocked. A fresh air intake register with an airtight damper may be installed to help prevent any uncomfortable air draft.

When the stove and the chimney are completely cold, it may be necessary before starting up to provide an external air supply by opening a door or a window for a short period. A house constructed or renovated in a waterproof manner is prone to not having the air exchange required for the proper functioning of a wood heating appliance.

In that case, avoid, during startups, to use appliances that evacuate air outside of the house, such as:

- Cookstove hood
- Bathroom vent
- Air exchange system
- Ventilated central vacuum cleaner
- Dryer

The supply of fresh combustion air can be done in several ways, provided they comply with CSA B365 and NFPA211.

In Canada, wood stoves are not required to have a combustion air supply from outside, except for mobile homes. Research has shown that outside air supply do not compensate for the depressurization of the house and may not be sufficient to provide a supply of combustion air in windy weather. However, to reduce the risks against smoke spillage due to house depressurization,

a carbon monoxide (CO) detector is required in the room where the stove is installed. The CO detector will provide warning if for any reason the wood stove fails to function correctly.

### 6.6.1 Mobile Home

If your stove is 'mobile home approved', It must have a supply of combustion air from outdoors. The air intake must not draw air from the attic, from the basement, from a garage or any enclosed space. Air must be drawn from a ventilated crawl space under the floor or directly from outside. Install a flexible or rigid, insulated pipe (HVAC type, must comply to ULC S110 and/or UL 181, Class 0 or Class 1) to the fresh air intake.

Where a mobile home has been converted to a standard house by mounting it on a permanent basement foundation, the supply of outdoor air is not required.

**It is prohibited to use this wood stove with a fire screen in a mobile home.**

### 6.6.2 Conventional House

The safest and most reliable supply of combustion air for a wood stove is from the room in which it is installed. Room air is already preheated so it will not chill the fire, and its availability is not affected by wind pressures on the house. Contrary to commonly expressed concerns, almost all tightly sealed new houses have enough natural leakage to provide the small amount of air needed by the stove. The only case in which the wood stove may not have adequate access to combustion air is if the operation of a powerful exhaust device (such as a kitchen range exhaust) causes the pressure in the house to become negative relative to outdoors.

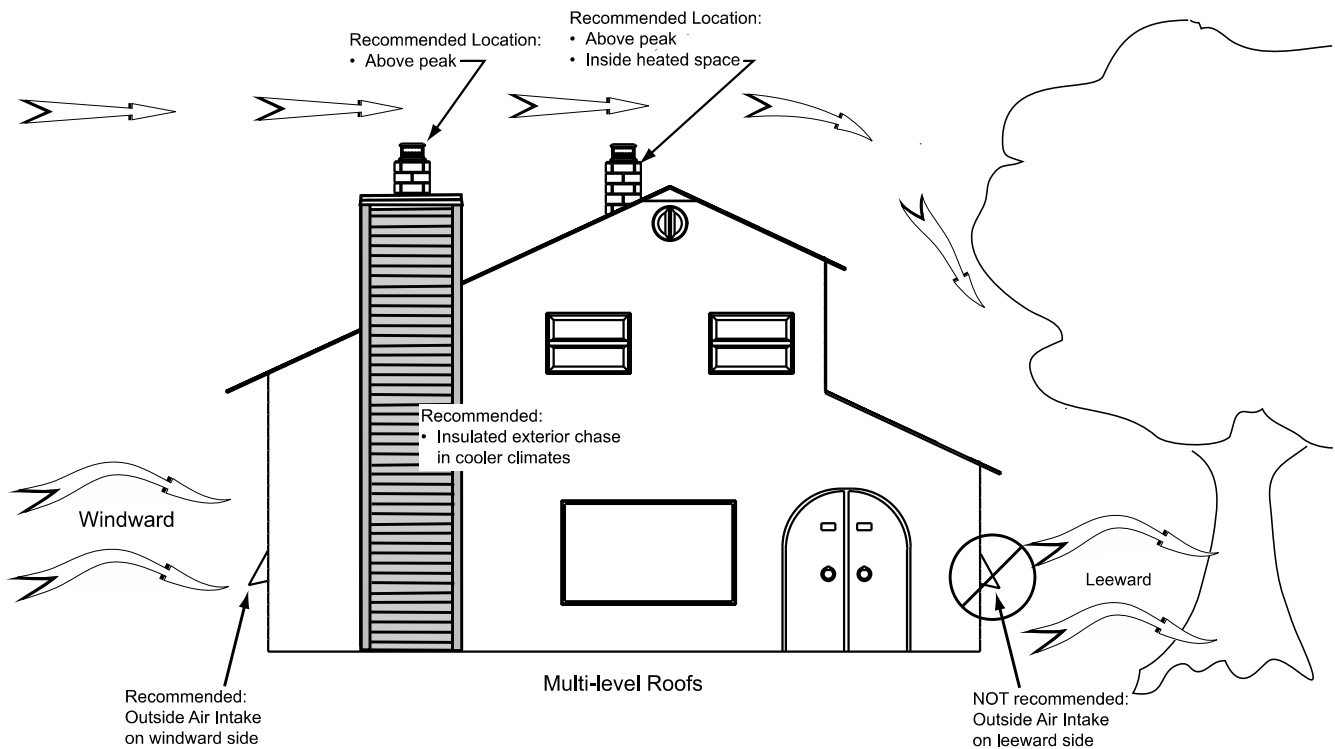


Figure 5: Air supply in conventional houses

If an air intake is installed through the wall of the house, its pressure can vary during windy weather. If there are changes in wood stove performance in windy weather, and in particular if smoke puffs from the stove, the air duct should be disconnected from the stove to determine if it is the cause of the problem. In some windy conditions, negative pressure at the duct weather



hood outside the house wall may draw hot exhaust gases from the stove backwards through the duct to outdoors. Check the outdoor air duct for soot deposits when the full system is cleaned and inspected at least once each year.

To reduce the risks against smoke spillage due to house depressurization, a carbon monoxide (CO) and a smoke detector is required in the room where the stove is installed. The CO detector will provide warning if for any reason the wood stove fails to function correctly.

## 6.7 Installing the Chimney Connector

The chimney connector is the single or double wall pipe installed between the stove flue collar and the chimney breech. Single wall pipe components are available from most hardware and building supply stores. These components are not usually tested to a particular standard and certified as compliant. Therefore, a list of rules found in solid fuel installation codes apply to the installation of a single wall pipe.

Double wall chimney connectors are tested and certified. The rules for double wall pipe are found in the manufacturer's installation instructions. These rules will be very different than those for single wall.

### 6.7.1 Installation of Single Wall Chimney Connector

The chimney connector assembly has been called 'the weak link' in the safety of wood heating systems because failure to install the connector properly (which has been common in the past) can result in house fires.

The best flue pipe assembly is one that rises straight up from the stove to the base of the chimney with no elbows. Straight assemblies are less likely to cause problems like smoke roll-out when the door is opened for loading. They are also more stable and easier to maintain than assemblies with elbows. Horizontal runs of flue pipe should be avoided where possible because they reduce chimney draft.

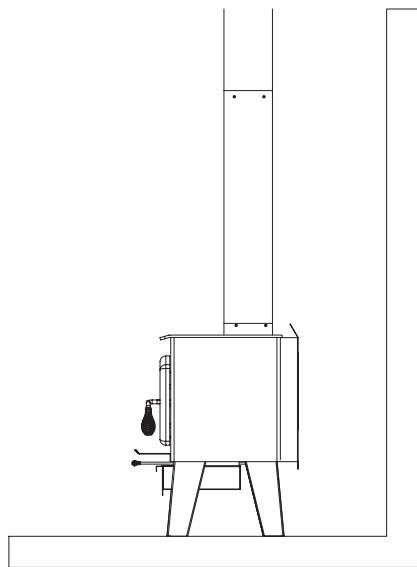


Figure 6: Best

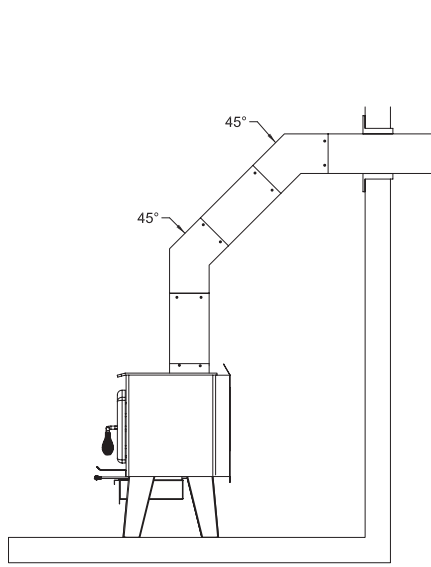


Figure 7: Acceptable

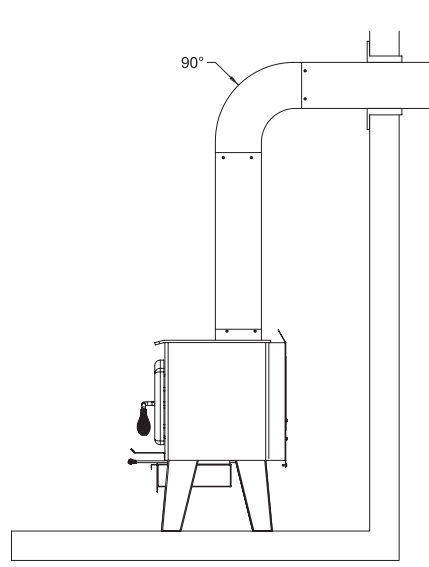


Figure 8: Avoid

The rules below are based on those found in the CSA-B365 installation code. Please carefully follow these installation instruction rules, or those enforced by the local code.

- Maximum overall length of horizontal pipe: 10 ft. (3 m) including elbows.
- Minimum clearance from combustible material: 18" (450 mm). The minimum clearance may be reduced by 50 percent to 9" (225 mm) if suitable shielding is installed either on the pipe or on the combustible surface.
- The assembly should be as short and direct as possible between the stove and chimney. The use of two 45 degree elbows is often preferable to a single 90 degree elbow because less turbulence is created in the exhaust flow and they result in less horizontal run.
- The minimum overall height of the chimney system, measured from the stove top to the exterior termination cap of the chimney should be at least 12 ft. (3.66 m). A chimney which is too short may lack the "tunnel effect" required to obtain a proper draft.
- Maximum number of 90-degree elbows: 2.
- Maximum unsupported horizontal length: 3 ft. (1 m).
- Galvanized flue pipes must not be used because the coatings vaporize at high temperatures and release dangerous gases. Use black painted flue pipes.
- Flue pipes must be at least 24 gauge in thickness.
- Flue pipe joints should overlap 1 ¼" (30 mm).
- Each joint in the assembly must be fastened with at least three screws.
- The assembly must make allowance for expansion: elbows in assemblies allow for expansion; straight assemblies should include an inspection wrap with one end unfastened, or a telescopic section.
- Minimum upward slope towards the chimney: ¼ in/ft. (20 mm/m).
- **One end of the assembly must be securely fastened to the flue collar** with 3 sheet metal screws and the other end securely fastened to the chimney.
- There must be provision for cleaning of the pipes, either through a clean out or by removal of the pipe assembly. Removal of the assembly should not require that the stove be moved.
- The male ends of the sections must be oriented towards the appliance so that falling dust and condensation stay inside the pipe.
- A flue pipe must never pass through a combustible floor or ceiling or through an attic, roof space, closet or concealed space. Where passage through a wall or partition of combustible construction is desired, the installation shall conform to CAN/CSA-B365, Installation Code for Solid-Fuel-Burning Appliances and Equipment.
- A straight up connector assembly needs either a telescopic length or an inspection wrap (pipe coupler) to allow it to be assembled and disassembled without moving the stove.
- A straight flue pipe assembly offers the least restriction to gas flow and results in a stronger draft. Straight assemblies also need less maintenance because there are no corners to collect creosote.
- The chimney and chimney connector must be clean and in good condition.



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Stove Builder International inc.  
250, rue de Copenhague,  
St-Augustin-de-Desmaures (Québec) Canada  
G3A 2H3  
1-877-356-6663  
[www.sbi-international.com](http://www.sbi-international.com)  
[tech@sbi-international.com](mailto:tech@sbi-international.com)



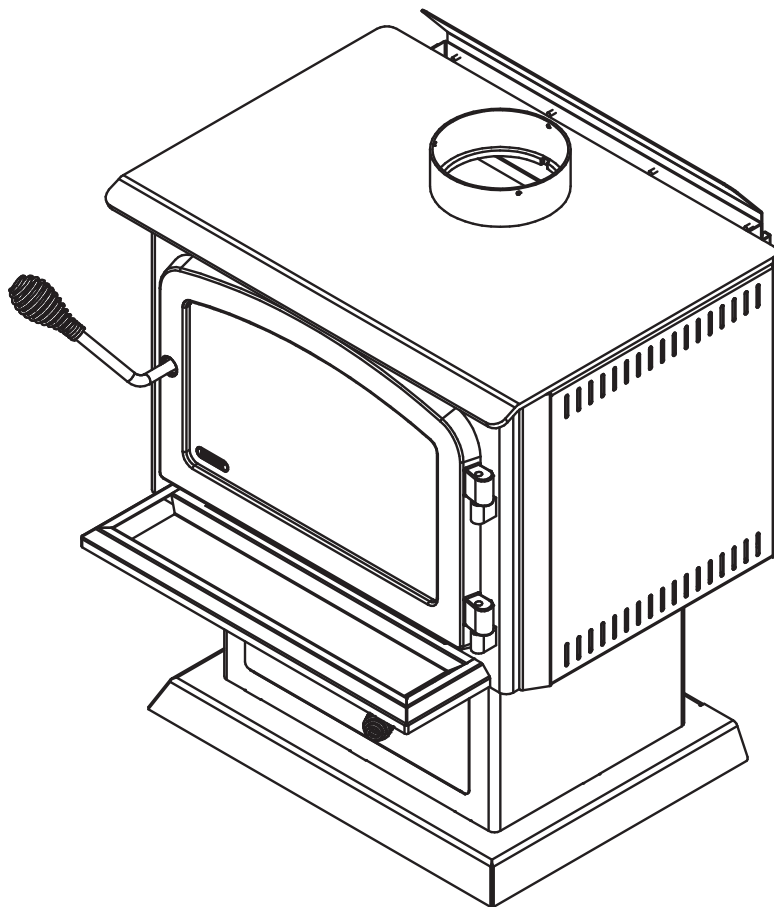
# Wood Stove Owner's Manual

## Part 2 of 2

### BLACKCOMB II

(DB02811 model)

#### INSTALLATION AND OPERATION REQUIREMENTS



US Environmental Protection Agency  
phase II certified wood stove compliant  
with 2020 cord wood standard

EPA  
 $\leq 2.5$  g/h

Safety tested according to CAN/ULC  
S627, UL 1482 and UL 737 standards  
by an accredited laboratory.



ENGLISH

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

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD STOVE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

**READ AND KEEP THIS MANUAL FOR REFERENCE**

Dealer: \_\_\_\_\_

Installer: \_\_\_\_\_

Phone Number: \_\_\_\_\_

**Serial Number:** \_\_\_\_\_

### ONLINE WARRANTY REGISTRATION

If the unit requires repairs during the warranty period, proof of purchase must be provided. The purchase invoice must be kept. The date indicated on it establishes the warranty period. If it can not be provided, the warranty period will be determined by the date of manufacture of the product. It is also highly recommended to register the warranty online at

<https://www.drolet.ca/en/warranty/warranty-registration/>

Registering the warranty will help to quickly find the information needed on the unit.



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# 1. CERTIFICATION PLATE



**Intertek**  
December/Décembre 2018  
Control Number (SA) : 4002461

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION  
SE RÉFÉRER AU REPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

STANDARDS / NORMES D'ESSAI:

Certified to/Certifié selon CAN/ULC S627 Certified to/Certifié selon CSA B415.1  
Certified to/Certifié selon UL 1482 Certified to/Certifié selon ASTM E3053  
Certified to/Certifié selon UL 737  
Certified to/Certifié selon ASTM E2515

LISTED SOLID FUEL BURNING  
APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE  
HOMOLOGUÉ

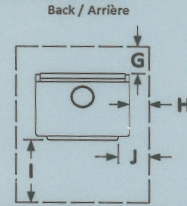
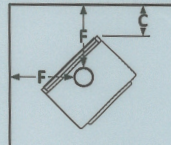
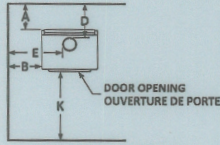
MODEL / MODÈLE :

**BLACKCOMB II**

Serial Number  
No. de Série

99999

## Clearances to combustibles / Dégagements aux combustibles



**CANADA**  
Single wall connector  
Tuyau à paroi simple  
A: 14.5 in./po. (368 mm)  
B: 10 in./po. (254 mm)  
C: 12 in./po. (305 mm)  
D: 18 in./po. (457 mm)  
E: 19 in./po. (483 mm)  
F: 20.75 in./po. (527 mm)  
Floor-ceiling/plancher-plafond: 84 in./po. (213cm)

**U.S.A.**  
Double wall connector  
Tuyau à paroi double  
A: 7.5 in./po. (191 mm)  
B: 10 in./po. (254 mm)  
C: 12 in./po. (305 mm)  
D: 11 in./po. (279 mm)  
E: 19 in./po. (483 mm)  
F: 20.75 in./po. (527 mm)

**MOBILE HOME  
MAISONS MOBILES**  
Double wall connector  
Tuyau à paroi double  
A: 10 in./po. (254 mm)  
B: 14.5 in./po. (368 mm)  
C: 12 in./po. (305 mm)  
D: 13.5 in./po. (343 mm)  
E: 23.5 in./po. (597 mm)  
F: 20.75 in./po. (527 mm)

**Protection de plancher/Floor protection**  
**CANADA**  
G: 8 in./po. (203 mm)  
H: 8 in./po. (203 mm)  
I: 18 in./po. (457 mm)  
K: 48 in./po. (1219 mm)

**U.S.A.**  
G: 8 in./po. (203 mm)  
H: 8 in./po. (203 mm)  
I: 16 in./po. (406 mm)  
J: 8 in./po. (203 mm)  
K: 36 in./po. (914 mm)

- PREVENT HOUSE FIRES** / **PRÉVENEZ LES INCENDIES**
- Install and use only in accordance with the manufacturer's installation and operating instructions.
  - Contact local building or fire officials about restrictions and installation inspection in your area.
  - Use listed 152 mm / 6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
  - See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
  - This stove must be installed as a freestanding heater with the clearances listed in the manufacturer's installation instructions. It is strictly forbidden to install this stove in a factory-built fireplace.
  - The space heater must be installed with legs or pedestal provided, attached as shown in the installation instruction.
  - Do not pass connector through combustible wall or ceiling.
  - Do not connect this unit to a chimney serving another appliance.
  - For use with solid fuel only. Do not use other fuels.
  - Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
  - Do not obstruct the space underneath the stove.
  - Do not use grate or elevate fire. Build fire directly on hearth.
  - Do not overfire. If heater or chimney connector glows, you are overfiring.
  - Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
  - Replace glass with ceramic type only.
  - Install unit on a non-combustible material extending as shown above on this label. Suitable for mobile-home installation.
  - Combustion air openings shall not be obstructed.
  - This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.
  - Installer et utiliser conformément au manuel d'utilisation du fabricant.
  - Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
  - Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
  - Voir les codes locaux et le manuel d'installation du fabricant pour le passage de la cheminée à travers un mur ou un plafond combustible.
  - Ce poêle doit être installé comme appareil de chauffage autonome avec les dégagements indiqués dans les instructions d'installation du fabricant. Il est strictement défendu d'installer ce poêle dans un foyer préfabriqué.
  - Le poêle doit être installé avec les pattes ou le piédestal fournis, fixés comme indiqué dans les instructions d'installation.
  - Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
  - Ne pas raccorder cet appareil à une cheminée desservant un autre appareil.
  - Pour l'usage avec du combustible solide seulement. Ne pas utiliser d'autres combustibles.
  - Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
  - Nc rien entreposer sous l'appareil.
  - Ne pas utiliser de grilles ou de chenets pour surélever le feu. Préparer le feu directement sur l'âtre.
  - Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
  - Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de crésote peut être rapide.
  - Remplacer la vitre seulement avec un verre de céramique.
  - Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
  - Poêle approuvé pour maison mobile.
  - Les entrées d'air servant à la combustion ne doivent pas être obstruées.
  - Cet appareil de chauffage requiert des inspections et réparations périodiques.
  - Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: AC02050 (115V, 0.8A, 60Hz)

Option ventilateur: AC02050 (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.  
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 2.4 g/h

Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii)

**WARNING:** This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.  
(For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov))



## CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

## ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

27734

Made in St-Augustin-de-Desmaures, (Qc), Canada  
20/06/2023 (# Test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures, (Qc), Canada  
20/06/2023 (# Test)



## 2. General Information

### 2.1 Performances

Values are as measured per test method, except for the recommended heating area, firebox volume, maximum burn time and maximum heat output.

Model	Blackcomb II (DB02811)	
Type of combustion	Non-catalytic	
Fuel Type	Dry Cordwood	
Recommended heating area (sq. ft.) <sup>1</sup>	500 to 1,800 ft <sup>2</sup> (46 to 167 m <sup>2</sup> )	
Overall firebox volume <sup>2</sup>	1.86 ft <sup>3</sup> (0.053 m <sup>3</sup> )	
EPA loading volume	1.44 ft <sup>3</sup> (0.041 m <sup>3</sup> )	
Maximum burn time <sup>1</sup>	8 hours	
Maximum heat output (dry cordwood) <sup>3</sup>	65,000 BTU/h (19 kW)	
Overall heat output rate (min. to max.) <sup>2 4</sup>	9,800 BTU/h to 52,200 BTU/h (2.87 kW to 15.3 kW)	
Average overall efficiency <sup>3</sup> (Dry cordwood)	68 % (HHV) <sup>5</sup>	73 % (LHV) <sup>6</sup>
Optimum overall efficiency <sup>7</sup>	76 %	
Optimum heat transfer efficiency <sup>8</sup>	76 % (HHV)	
Average particulate emissions rate <sup>9</sup>	2.4 g/h (EPA / CSA B415.1-10) <sup>10</sup>	
Average CO <sup>11</sup>	103 g/h	

<sup>1</sup> Recommended heating area and maximum burn time may vary subject to location in home, chimney draft, heat loss factors, climate, fuel type and other variables. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure.

<sup>2</sup> The overall firebox calculation is an approximation and is not intended to be used for loading. This volume includes a buffer zone to allow an easier fuel insertion, prevent ash spillage and allow the air wash to work properly.

<sup>3</sup> The maximum heat output (dry cordwood) is based on a loading density varying between 15 lb/ft<sup>3</sup> and 20 lb/ft<sup>3</sup>. Other performances are based on a fuel load prescribed by the standard. The specified loading density varies between 7 lb/ft<sup>3</sup> and 12 lb/ft<sup>3</sup>. The moisture content is between 19% and 25%.

<sup>4</sup> As measured per CSA B415.1-10 stack loss method.

<sup>5</sup> Higher Heating Value of the fuel.

<sup>6</sup> Lower Heating Value of the fuel.

<sup>7</sup> Optimum overall efficiency at a specific burn rate (LHV).

<sup>8</sup> The optimum heat transfer efficiency is for the low burn rate and represents the appliance's ability to convert the energy contained in the wood logs into energy transferred to the room in the form of heat and does not take into account the chemical losses during combustion.

<sup>9</sup> This appliance is officially tested and certified by an independent agency.

<sup>10</sup> Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) and ASTM E3053-17. Based on EPA letter dated November 1, 2022.

<sup>11</sup> Carbon monoxide.

## 2.2 Specifications

Recommended log length	16 in (406 mm) east-west
Maximum log length <sup>1</sup>	18 in (457 mm) east-west
Flue outlet diameter	6 in (150 mm)
Recommended connector pipe diameter	6 in (150 mm)
Type of chimney	ULC-S629, UL 103 HT (2100 °F)
Minimum chimney height	12 feet
Baffle material	Vermiculite
Approved for alcove installation	Yes
Approved for mobile home installation <sup>2</sup>	Yes
Type of door	Simple, glass with cast iron frame
Type of glass	Ceramic glass
Blower	Optional (up to 100 CFM)
Particulate emission standard <sup>3</sup>	EPA / CSA B415.1-10
USA standard (Safety)	UL 1482, UL 737
Canada standard (Safety)	CAN/ULC-S627

<sup>1</sup> North-south: ends of the logs visible, East-west: sides of the logs visible.

<sup>2</sup> Mobile homes (Canada) or manufactured homes (USA): The US Department of Housing and Urban Development describes “manufactured homes” better known as “mobile homes” as follows; buildings built on fixed wheels and those transported on temporary wheels/axles and set on a permanent foundation. In Canada, a mobile home is a dwelling for which the manufacture and assembly of each component is completed or substantially completed prior to being moved to a site for installation on a foundation and connection to service facilities and which conforms to the CAN/CSA-Z240 MH standard.

<sup>3</sup> Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) and ASTM E3053-17. Based on EPA letter dated November 1, 2022

## 2.3 Dimensions

### 2.3.1 Stove Dimensions

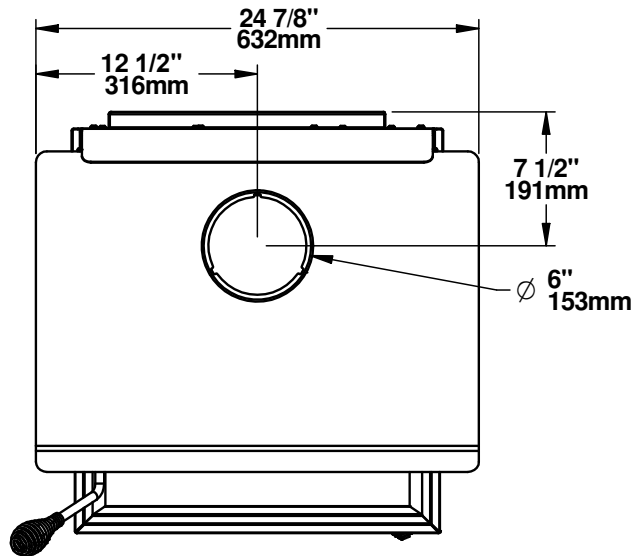


Figure 1: Top View

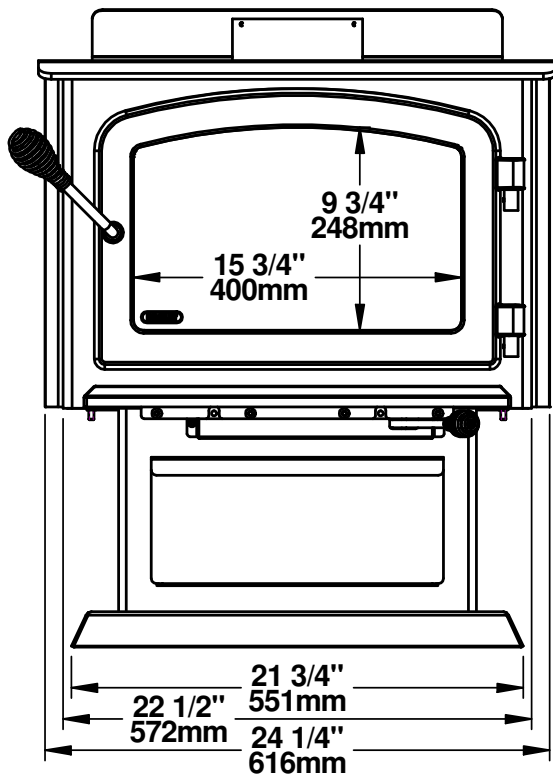


Figure 2: Front View

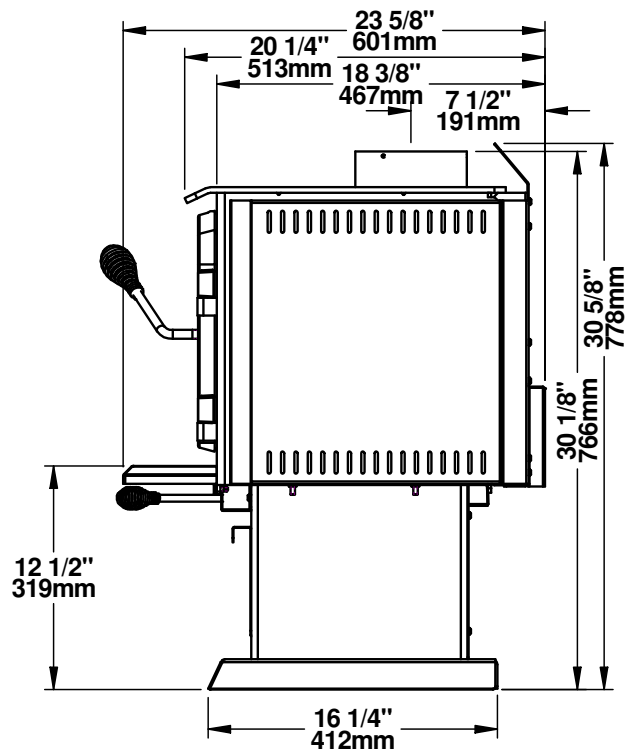


Figure 3: Side View

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### 2.3.2 Combustion Chamber Dimensions

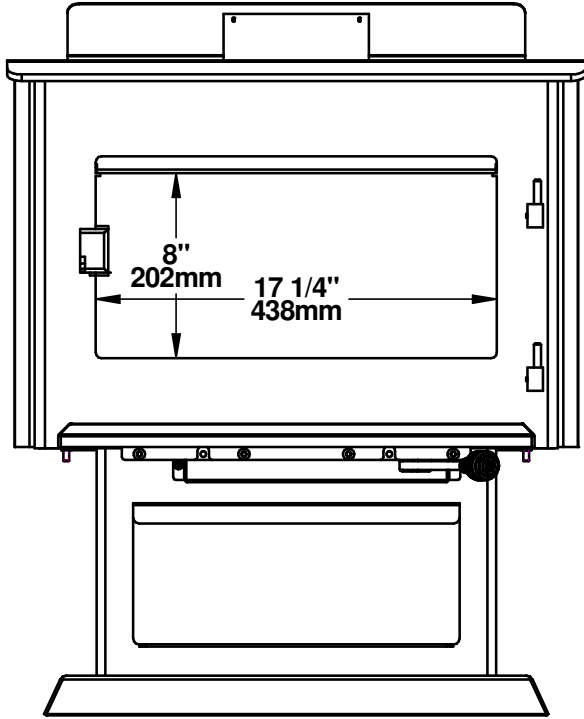


Figure 4: Door Opening

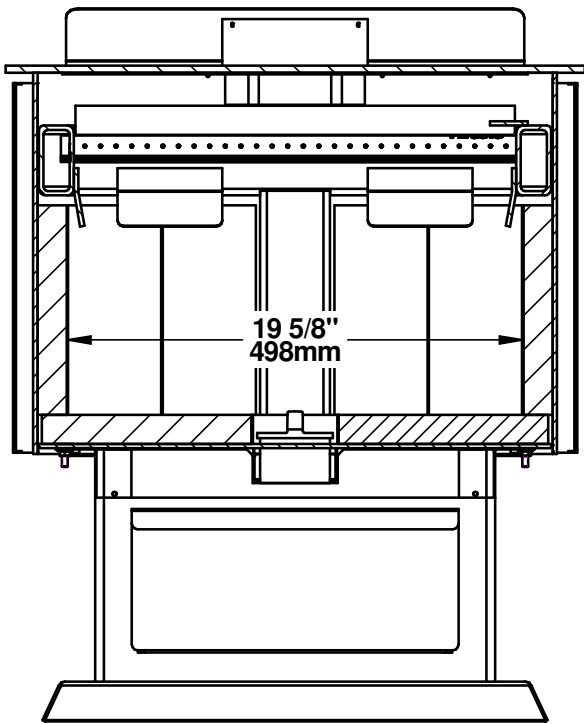


Figure 5: Front View - Combustion Chamber

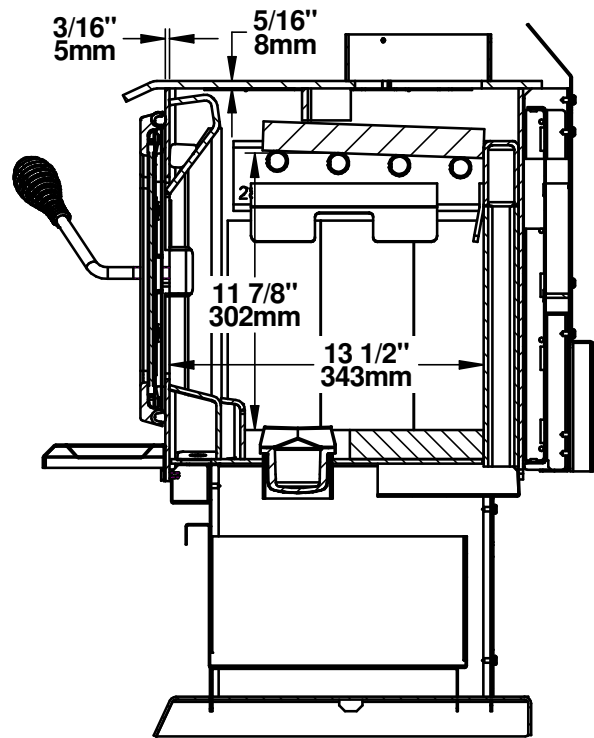


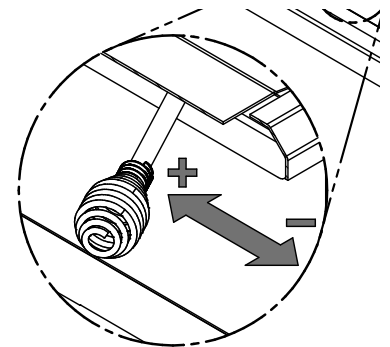
Figure 6: Side View - Combustion Chamber

## 1.1 EPA Loading Procedure

The best loading method for efficient and clean combustion with this fireplace is the EPA loading method. The images below show the space in the firebox where the logs are to be placed. It is important to always respect this space and not to put logs in the grid area marked with an X. The marked area is defined by the space between the glass and primary air channel. Leave enough space between the logs for good air circulation. Using more than the usable firebox volume for loading wood will result in poor combustion. The Usable firebox volume of 1.44 ft<sup>3</sup> shown below is the one used during EPA emissions certification. The log length recommended for this stove is 16 inches and the EPA testing were done with log length of 16 in. The fuel specie used for the EPA certification was beech.

### 1.1.1 Air control

The air control is located underneath the ash shelf. To open the air control, push the air control handle completely to the left (High). This will increase the burn rate. To close the air control, push the air control handle completely to the right. This will permit to achieve the lowest possible burn rate.



### 1.1.2 High burn rate (primary air control open)

For Kindling and Start-up fuel configuration refer to the pictures below. Split the start-up fuel log into 6 pieces. Crisscross at 45 degrees the 6 pieces on the brick on 3 rows (From the bottom, first row 2 smallest-second row 2 biggest- third row 2 medium) and leaving some space between each wood pieces. Crisscross at 45 degrees the kindling on the top of the start-up fuel on 3 rows, from biggest to smallest. The kindling is made of between 12-15 small pieces that are about 10% of moisture content. Place newspaper sheets on top of the kindling. Light up the paper and let the door at 90 degrees between one minute and one minute and 30 seconds, then close the door. Air control is fully open.

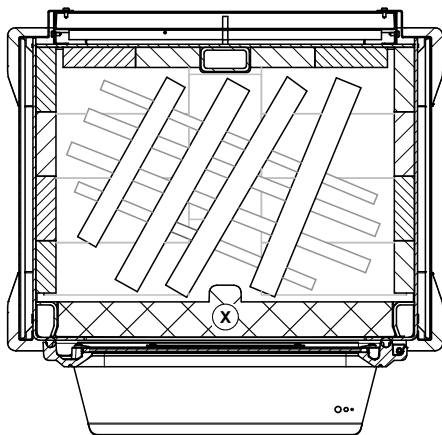


Figure 7: Start-up fuel

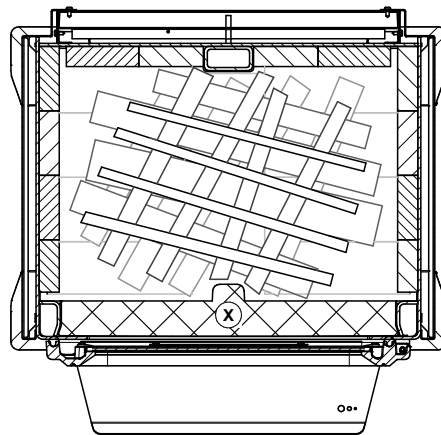


Figure 8: Kindling

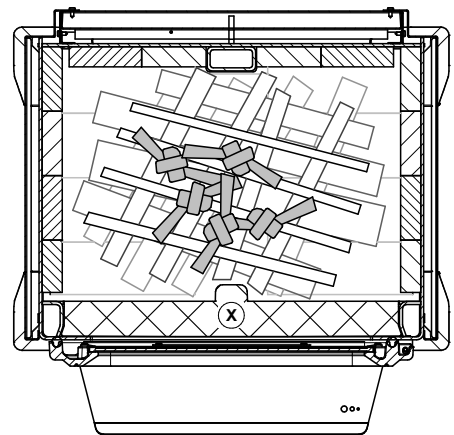


Figure 9: Newspaper

When there are only faint flames remaining and most of the wood is turned into coal, break ashes and level coal bed. Close the door.

Add High Fire load in an East-West configuration. Put 3 first pieces on the coal bed. Leave about 2 inches of air space between the rear firebrick and the first piece. See Figure 10 and 11 for an example of high burn load inside the firebox. The front (3rd) piece should stand off on the steel andirons by approximately 1-2 inches. The 2 other pieces should be added on top of the first

3, stacked in the middle, in an East-West orientation. Let the door open at 90 degrees between one minute and one minute and 30 seconds. Close the door, start the blower at maximum speed, and let burn until the weight is down to target.

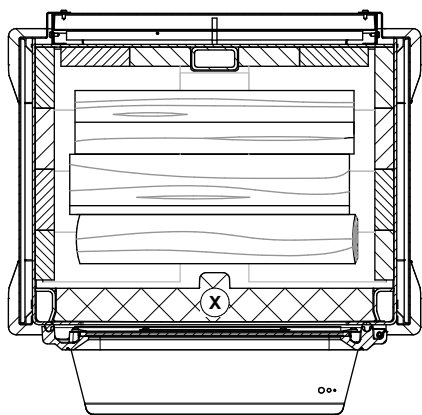


Figure 10: Position of the bottom pieces (High burn)

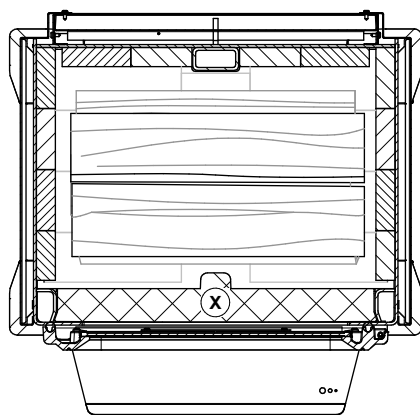


Figure 11: Position of the two top pieces (High burn)

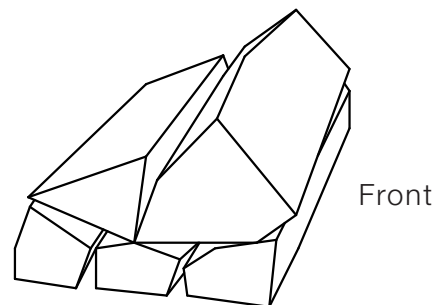


Figure 12: Example high burn load (side view)

For optimal loading of a high fire, take small to medium size fuel pieces (between 2- and 3-inches cross section dimensions approximately) on the bottom and use medium to large size fuel pieces (3.5 to 4.5 inches of cross section dimensions approximately) on top. To make sure combustion is equal, put the biggest piece on top of the first three, at the front of the firebox. See an example of high burn load in the Figure 12 above.

### 1.1.3 Low burn rate

After the high fire, if there is visible yellow flame, close the air control. When the charcoal bed weight is between 14 and 17% of the low fire load weight, turn off the blower, open the door, stir the coals slightly, just enough to have a level plane coal bed, and let the door remain slightly open for 1 minute before loading the low burn test fuel.

For the loading, put 3 first pieces on the coal bed in an East-West orientation. Leave approximately 1 inch of air space between the rear firebrick and the first piece. There should be air space between all pieces. The front (3rd) piece may contact the steel andirons. The 2 top pieces (fourth and fifth) should be added on top of the first 3, slightly angled (10° from the 3 wood pieces at the bottom). The distance between the logs should be approximately 1 inch. See Figure 13 and 14 for an example of low burn load inside the firebox.

For optimal low fire load, use medium to large size fuel pieces (between 4- and 5.5-inches cross section dimensions approximately) on the bottom and use small to medium size fuel pieces (2.5 to 4 inches cross section dimensions approximately) on top. To make sure combustion is equal, put the smallest piece on top of the first three, at the back of the firebox (see Figure 15 for an example of low burn load).

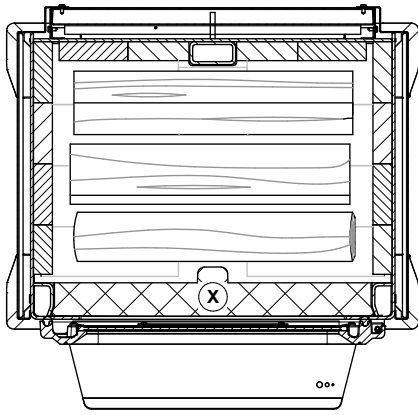


Figure 13: Position of the bottom pieces (Low burn)

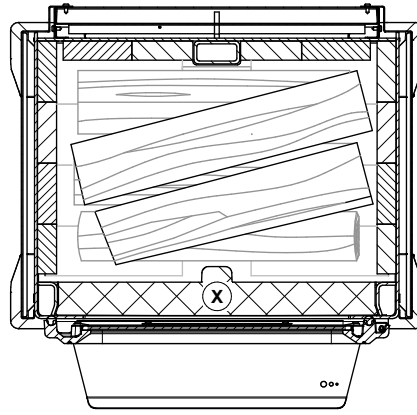


Figure 14: Position of the two top pieces (Low burn)

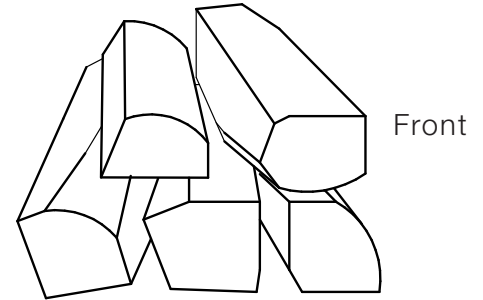


Figure 15: Example low burn load (side view)

Let the door ajar at 90° until the flames roll on top of the fuel (between 2:00 and 4:00 minutes) and then close the door with the primary air control open. See picture below for rolling flame:



Close the primary air control by small increments (ex: 1/16 of an inch), from ½” to fully closed, between 4 and 15 minutes after the loading period. Before closing further, make sure the flame intensity is increasing or stable. Close the air control completely. Turn ON the blower at maximum speed.

#### 1.1.4 Medium burn rate

After the high fire, if there is visible yellow flame, close the air control. When the charcoal bed weight is between 14 and 17% of the medium fire load weight, turn off the blower, open the door, stir the coals slightly, just enough to have a level plane coal bed, and let the door remain slightly open for 1 minute before loading the medium burn test fuel.

For the loading, put 3 first pieces on the coal bed in an East-West orientation. Leave about 1 to 2 inches of air space between the rear firebrick and the first piece. The front (3rd) piece should stand off from the steel andirons by approximately 1 inch. The 2 top pieces (fourth and fifth) should be added on top of the first 3, slightly angled (10° from horizontal, top view). The distance between the logs should be approximately 1 inch. See Figure 16 and 17 for an example of medium burn load inside the firebox.

For optimal medium fire load, use medium to large size fuel pieces (between 4- and 5.5-inches cross section dimensions approximately) on the bottom and use small to medium size fuel pieces (2.5 to 4 inches cross section dimensions approximately) on top. To make sure combustion is

equal, put the smallest piece on top of the first three, at the back of the firebox (see Figure 18 for an example of medium burn load).

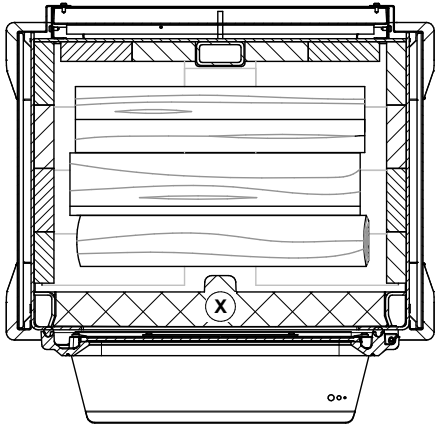


Figure 16: Position of the bottom pieces (Medium burn)

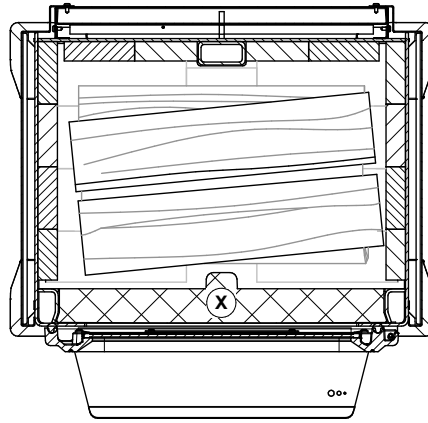


Figure 17: Position of the two top pieces (Medium burn)

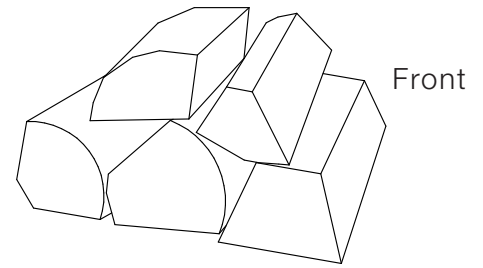


Figure 18: Example medium burn load (side view)

Let the door ajar at 90° until the flames roll on top of the fuel (between 2:30 and 5:00) and then close the door with the primary air control open. See picture below for rolling flame:



Close the primary air control by small increments (ex: 1/16 of an inch) until reaching the mid-point of air control position, between 4 and 15 minutes after the loading period. Before closing further, make sure the flame intensity is increasing or stable. Turn ON the blower at maximum speed.



### 3. Clearances to Combustible Material

The clearances shown in this section have been determined by tests according to procedures set out in safety standards CAN/ULC S627 (Canada), UL 1482 (U.S.A.) and UL 737 (U.S.A.). When the stove is installed so that its surfaces are at or beyond the minimum clearances specified, combustible surfaces will not overheat under normal and even abnormal operating conditions.

**No part of the stove or flue pipe may be located closer to combustibles than the minimum clearance figures given.**

**Clearances may only be reduced by means approved by the regulatory authority.**

The clearances to combustible walls may be slightly different in Canada and the U.S.A. and may also differ depending on whether single or double wall flue pipe is used. Make sure to choose the correct clearance for the stove location and type of flue pipe.

The clearances of the appliance and the flue pipes must be met individually, meaning the appliance cannot be installed closer to the combustible materials than the single or double wall pipe allows. For a safe way to reduce clearances refer to section "5. Reducing Wall and Ceiling Clearances Safely" of this manual.

#### 3.1 Clearances

	APPLIANCE CLEARANCES WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	14 ½" (368 mm)	13" (330 mm)
<b>B</b>	10" (254 mm)	10" (254 mm)
<b>C</b>	12" (305 mm)	12" (305 mm)

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	7-1/2" (191 mm)	7-1/2" (191 mm)
<b>B</b>	10" (254 mm)	10" (254 mm)
<b>C</b>	12" (305 mm)	12" (305 mm)

If the above clearances are met, then the distances measured from the flue outlet will be:

	DISTANCES <sup>1</sup> FROM PIPE CONNECTOR WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	18" (457 mm)	16 ½" (419 mm)
<b>E</b>	19" (483 mm)	19" (483 mm)
<b>F</b>	20 ¾" (527 mm)	20 ¾" (527 mm)

	DISTANCES <sup>1</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTORE	
	Canada	USA
<b>D</b>	11" (279 mm)	11" (279 mm)
<b>E</b>	19" (483 mm)	19" (483 mm)
<b>F</b>	20 ¾" (527 mm)	20 ¾" (527 mm)

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<sup>1</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

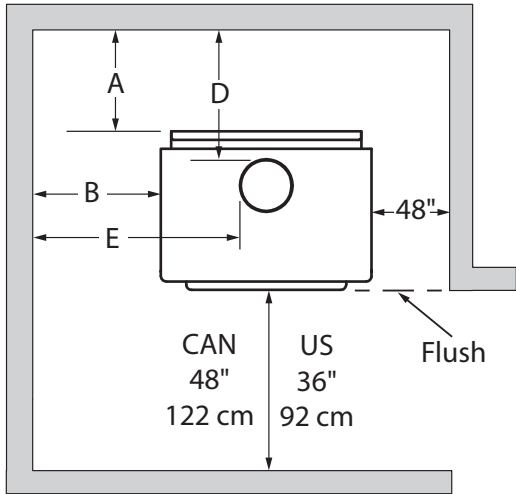


Figure 19: Clearances - Top

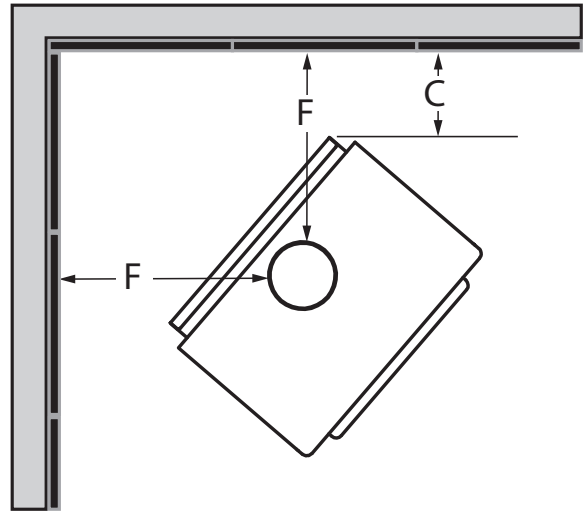


Figure 20: Clearances - Corner

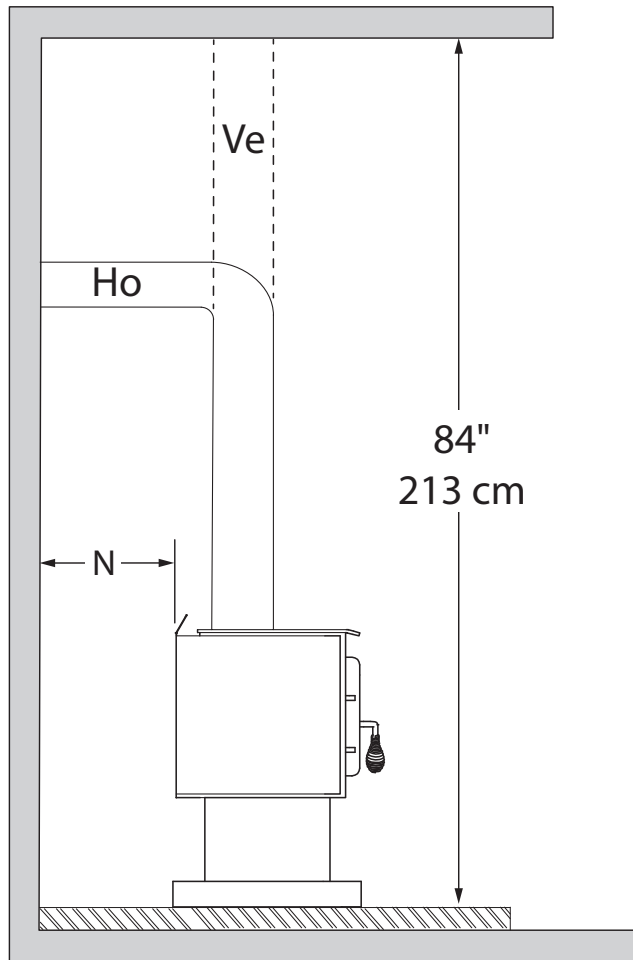


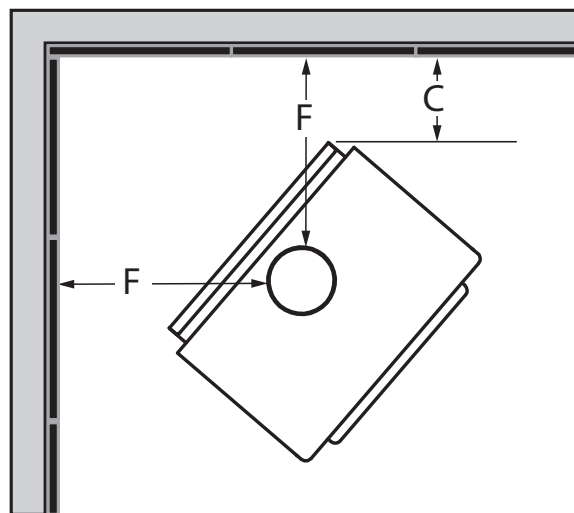
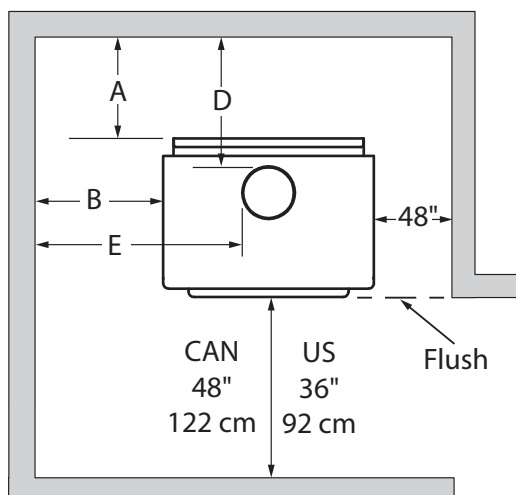
Figure 21: Clearances - Side

### 3.1.1 With Heat Shield AC02762<sup>1</sup>

To reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used. Refer to the booklet in the screen options to obtain the dimensions to be respected.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	2 ½" (64 mm)	2 ½" (64 mm)
<b>B</b>	2 ½" (64 mm)	2 ½" (64 mm)
<b>C</b>	2 ½" (64 mm)	2 ½" (64 mm)

	DISTANCES <sup>2</sup> FROM DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	6" (152 mm)	6" (152 mm)
<b>E</b>	11 ½" (292 mm)	11 ½" (292 mm)
<b>F</b>	11 ¼" (286 mm)	11 ¼" (286 mm)



**If the clearance reduction is on the same side as the door handle, position the stove at a minimum of 6 inches from the side wall (clearance B), otherwise it may be located at the clearance shown in the table above.**

ENGLISH

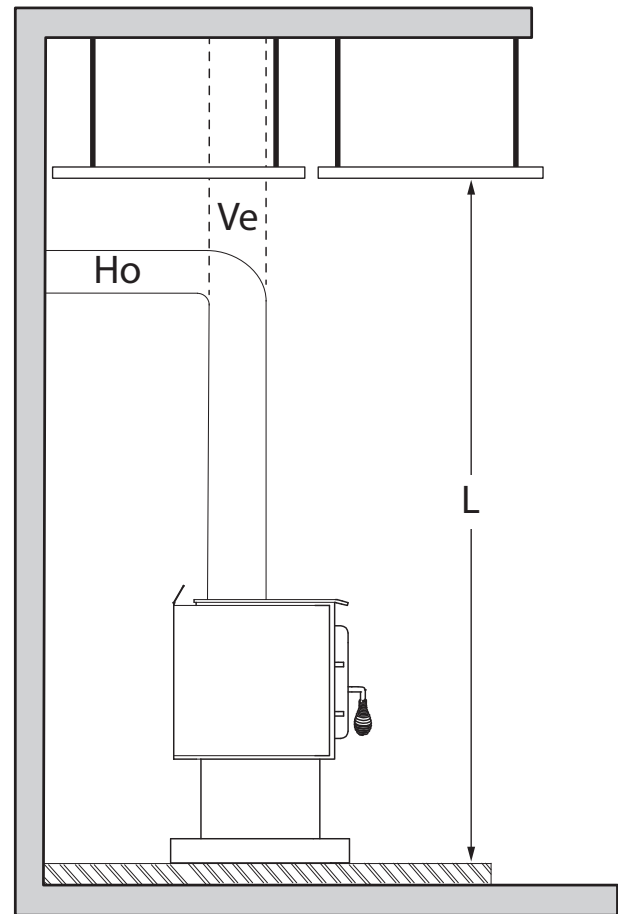
<sup>1</sup> Note that to reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used.

<sup>2</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

### 3.1.2 With Lowered Ceiling

	APPLIANCE CLEARANCES WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	14 ½" (368 mm)	14 ½" (368 mm)
<b>B</b>	12" (305 mm)	12" (305 mm)
<b>C</b>	13" (330 mm)	13" (330 mm)
<b>L</b>	78" (1981 mm)	78" (1981 mm)

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	9 ½" (241 mm)	9 ½" (241 mm)
<b>B</b>	12" (305 mm)	12" (305 mm)
<b>C</b>	13" (330 mm)	13" (330 mm)
<b>L</b>	78" (1981 mm)	78" (1981 mm)



If the above clearances are met, then the distances measured from the flue outlet will be:

	DISTANCES <sup>1</sup> FROM PIPE CONNECTOR WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	18" (457 mm)	18" (457 mm)
<b>E</b>	21" (533 mm)	21" (533 mm)
<b>F</b>	21 ¾" (552 mm)	21 ¾" (552 mm)

	DISTANCES <sup>1</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	13" (330 mm)	13" (330 mm)
<b>E</b>	21" (533 mm)	21" (533 mm)
<b>F</b>	21 ¾" (552 mm)	21 ¾" (552 mm)

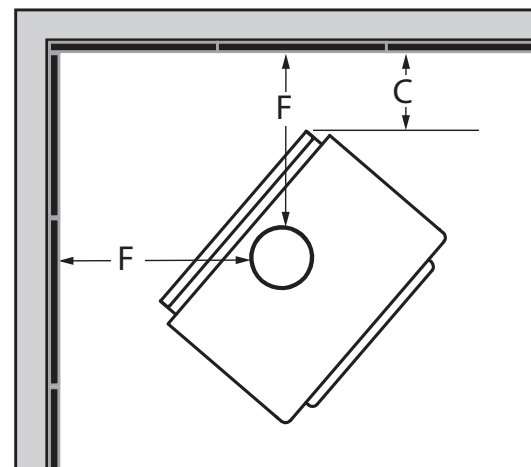
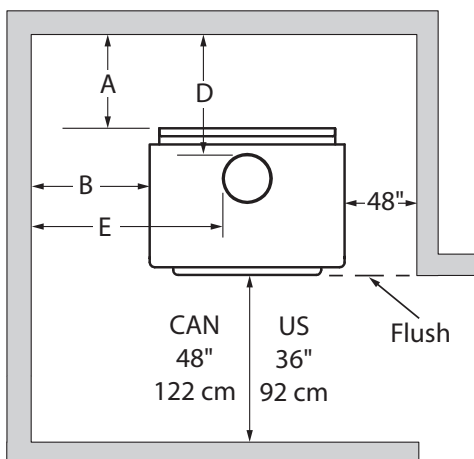
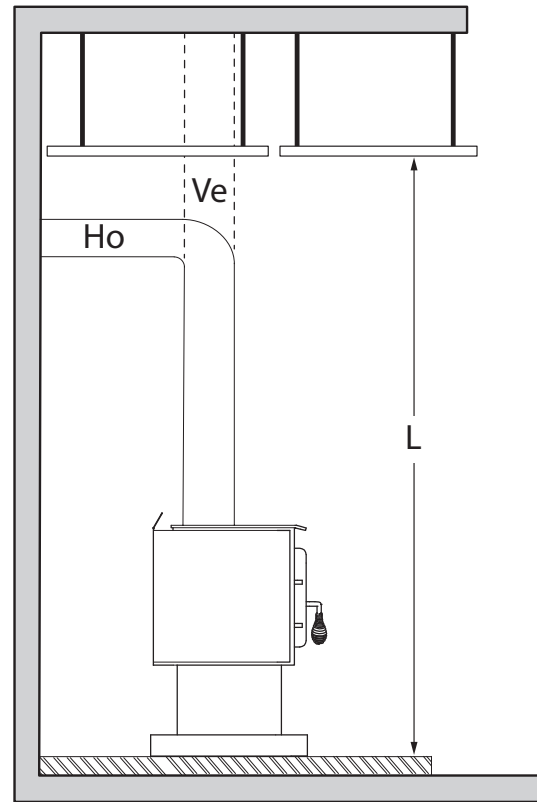
<sup>1</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

### 3.1.3 With Heat Shield AC02762 and Lowered Ceiling

To reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used. Refer to the booklet in the screen options to obtain the dimensions to be respected.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	2 ½" (64 mm)	2 ½" (64 mm)
<b>B</b>	2 ½" (64 mm)	2 ½" (64 mm)
<b>C</b>	2 ½" (64 mm)	2 ½" (64 mm)
<b>L</b>	78" (1981 mm)	78" (1981 mm)

	DISTANCES <sup>1</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	6" (152 mm)	6" (152 mm)
<b>E</b>	11 ½" (292 mm)	11 ½" (292 mm)
<b>F</b>	11 ¼" (286 mm)	11 ¼" (286 mm)



**If the clearance reduction is on the same side as the door handle, position the stove at a minimum of 6 inches from the side wall (clearance B), otherwise it may be located at the clearance shown in the table above.**

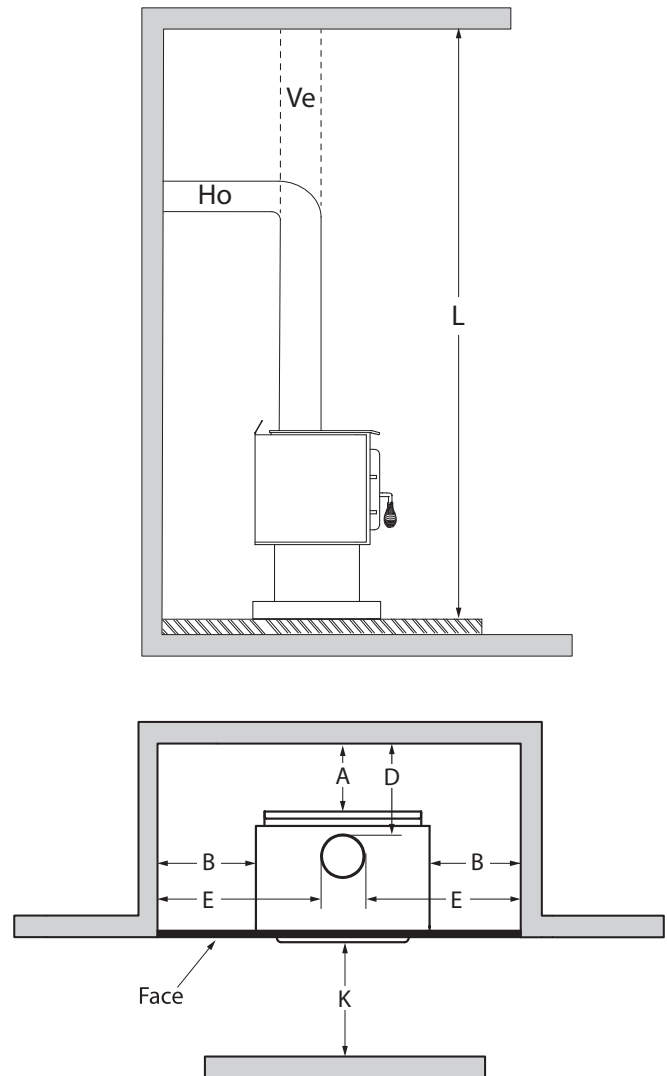
<sup>1</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

### 3.1.4 Inside a Combustible Alcove

See section 3.1 for the single wall pipe installation.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	12 ½" (318 mm)	12 ½" (318 mm)
<b>B</b>	16" (406 mm)	16" (406 mm)
<b>K</b>	48" (1219 mm)	36" (914 mm)
<b>L</b>	78" (1981 mm)	78" (1981 mm)

	DISTANCES <sup>1</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	16" (406 mm)	16" (406 mm)
<b>E</b>	25" (635 mm)	25" (635 mm)



### 3.1.5 Mobile Home

It is strictly **forbidden** to install a unit with a **single wall pipe** in a **mobile home**.

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	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	10" (254 mm)	10" (254 mm)
<b>B</b>	14 ½" (368 mm)	14 ½" (368 mm)
<b>C</b>	12" (305 mm)	12" (305 mm)

	DISTANCES <sup>1</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	13 ½" (343 mm)	13 ½" (343 mm)
<b>E</b>	23 ½" (597 mm)	23 ½" (597 mm)
<b>F</b>	20 ¾" (527 mm)	20 ¾" (527 mm)

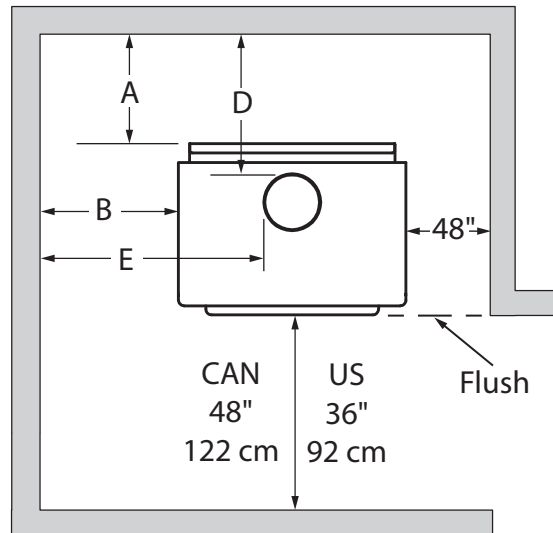
<sup>1</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

### 3.1.6 Mobile Home With Heat Shield AC02762

It is strictly **forbidden** to install a unit with **a single wall pipe** in a **mobile home**.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	3" (76 mm)	3" (76 mm)
<b>B</b>	5" (127 mm)	5" (127 mm)
<b>C</b>	3" (76 mm)	3" (76 mm)

	DISTANCES <sup>1</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	6 ½" (165 mm)	6 ½" (165 mm)
<b>E</b>	14" (356 mm)	14" (356 mm)
<b>F</b>	11 ¾" (298 mm)	11 ¾" (298 mm)



<sup>1</sup> Les distances de tuyau listées dans ce tableau se réfèrent aux distances obtenues lorsque le poêle est installé en accord avec les dégagements de l'appareil mentionnés ci-dessus.

## 4. Floor Protection

This stove is meeting the requirements of CAN/ULC-S627 and is suitable for installation on a combustible floor. However, it must be placed on a non-flammable surface to protect the floor from hot embers that may fall during loading.

The floor protection must be a continuous, non combustible material, such as steel with a minimum thickness of 0.015" (0.38 mm) or ceramic tiles sealed together with grout. Cement board, brick, or any other approved or listed material suited for floor protection. No R factor required.

Any type of tile will require a continuous non combustible sheet beneath to prevent the possibility of embers falling through to the combustible floor if cracks or separation should occur in the finished surface. Check local codes for approved alternatives.

No protection is required if the unit is installed on a non-combustible floor (ex: concrete).

	FLOOR PROTECTION	
	Canada <sup>1</sup>	USA
<b>G</b> <sup>2</sup>	8" (203 mm)	N/A
<b>H</b>	8" (203 mm)	N/A
<b>I</b>	18" (457 mm) From door opening	16" (406 mm) From door opening
<b>J</b>	N/A	8" (203 mm)
<b>K</b>	40 7/8" (1038 mm)	31 7/8" (810 mm)
<b>N</b> <sup>3</sup>	N/A	See note 3
<b>S</b>	46 1/4" (1175 mm)	36 1/4" (921 mm)
<b>T</b>	32 3/4" (832 mm)	25 5/8" (651 mm)
<b>U</b>	40 7/8" (1038 mm)	31 7/8" (810 mm)
<b>V</b>	66 3/4" (1695 mm)	52 1/4" (1327 mm)

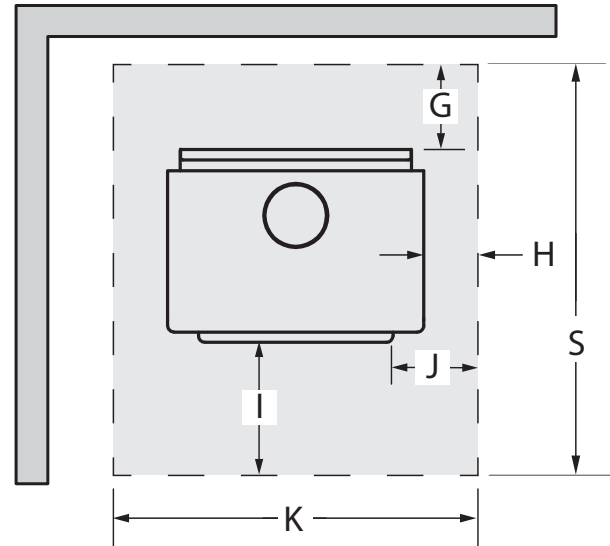
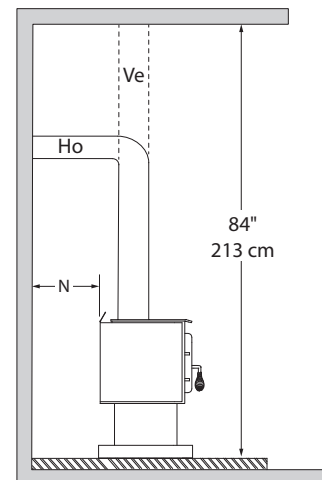
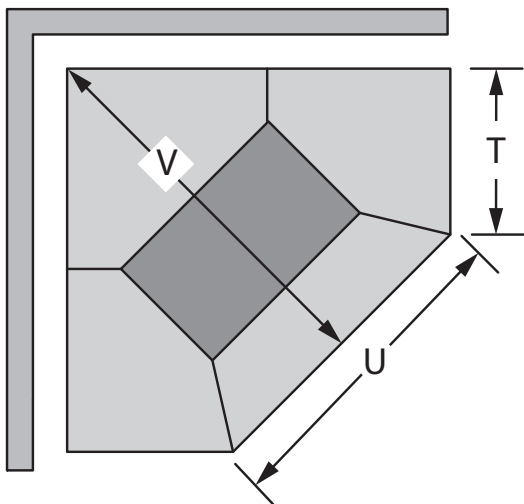


Figure 22: Floor Protection



<sup>1</sup> In Canada, to comply with CSA B365, Installation Code for Solid-Fuel-Burning Appliances and Equipment, any combustible covering beneath the appliance and/or within the area extending horizontally at least 450 mm (18 in) beyond the appliance on any side equipped with a door, and at least 200 mm (8 in) beyond the appliance on other sides, shall be protected by a continuous, durable, non-combustible pad that will ember protection. The 450 mm (18 in) ember protection required on any side with a door shall extend for the full width of the appliance plus the 200 mm (8 in) required on each side of the appliance without a door. Where the appliance is installed less than 200 mm (8 in) from a wall, the ember pad need only extend to the base of the wall. An ember pad shall not be placed on top of a carpet unless the pad is structurally supported to prevent displacement and distortion.

<sup>2</sup> The floor protection at the back of the stove is limited to the stove's required clearance if such clearance is smaller than 8 inches (203 mm).

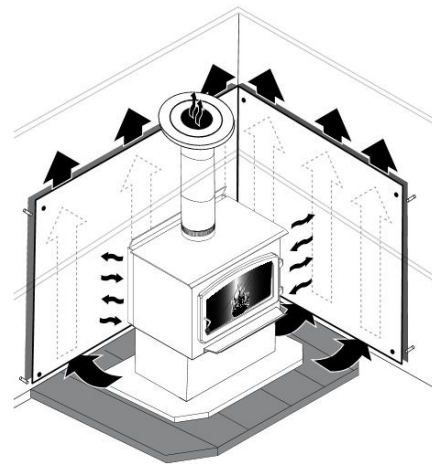
<sup>3</sup> Only required under the horizontal section (Ho) of the connector. Must exceed each side of the connector by at least 2 inches (51 mm).



## 5. Reducing Wall and Ceiling Clearances Safely

It is often desired to use as little space as possible when installing a wood stove. To do this, it is possible to reduce the clearances safely and install the stove closer to the walls by permanently installing a heat shield between the stove and the flammable material.

The rules for heat shields are sometimes complicated. Read and apply the instructions carefully. Some regions may have different regulations. Consult the local building code or contact the fire department for restrictions, inspection and installation requirements in the area.



**Warning: To reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used. Refer to the booklet in the screen options to obtain the dimensions to be respected.**

### 5.1 Shield Construction Rules

- Adhesives used in shield construction must not ignite or lose adhesive qualities at temperatures likely to be encountered.
  - Mounting hardware which extends from the shield surface into combustibles may be used only at the edges of the shield.
  - Mounting hardware must allow full vertical ventilation.
- A) Minimum clearance between the appliance top and an unshielded combustible ceiling: 49 7/8" (1267 mm)
  - B) Shield extension above the appliance: 20" (500 mm)
  - C) Minimum space behind the shield: 1" (25 mm). In Canada 7/8" (21 mm)
  - D) Clearance along the bottom of the shield: minimum 1" (25 mm) and maximum 3" (75 mm)
  - E) Minimum clearance along the top of the shield: 3" (75 mm)
  - F) Mounting hardware must not be located closer than 8" (200 mm) from the vertical centre line of the appliance.
  - G) Edge clearance for ceiling shields to side and back walls: 3" (75 mm)
  - H) Shield extension beyond each side of the appliance: 18" (450 mm)

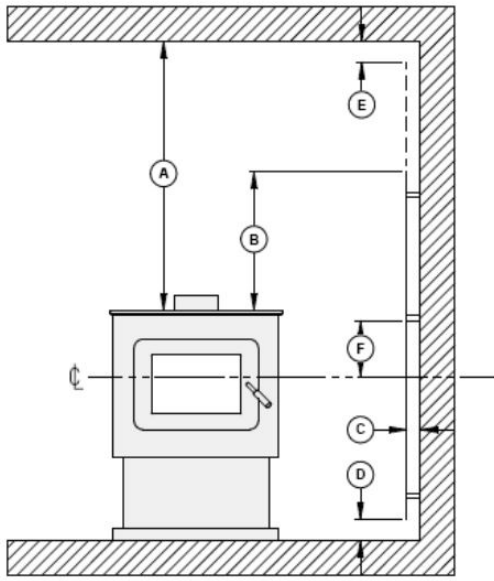


Figure 23: Heat shield clearances

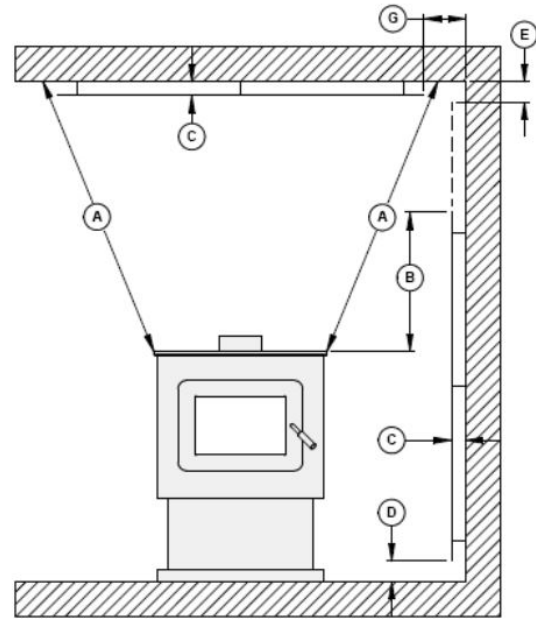


Figure 24: Heat shield clearances

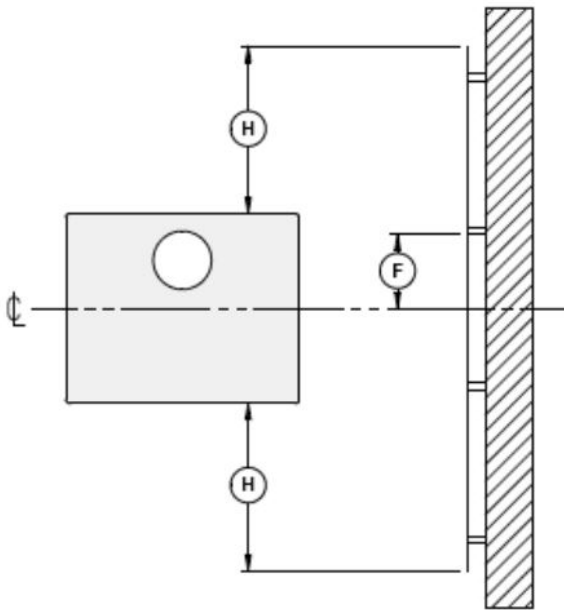


Figure 25: Heat shield clearances

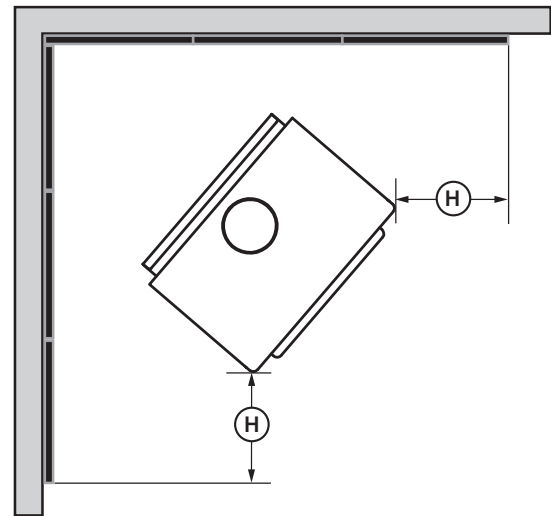

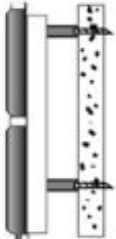





Figure 26: Heat shield clearances

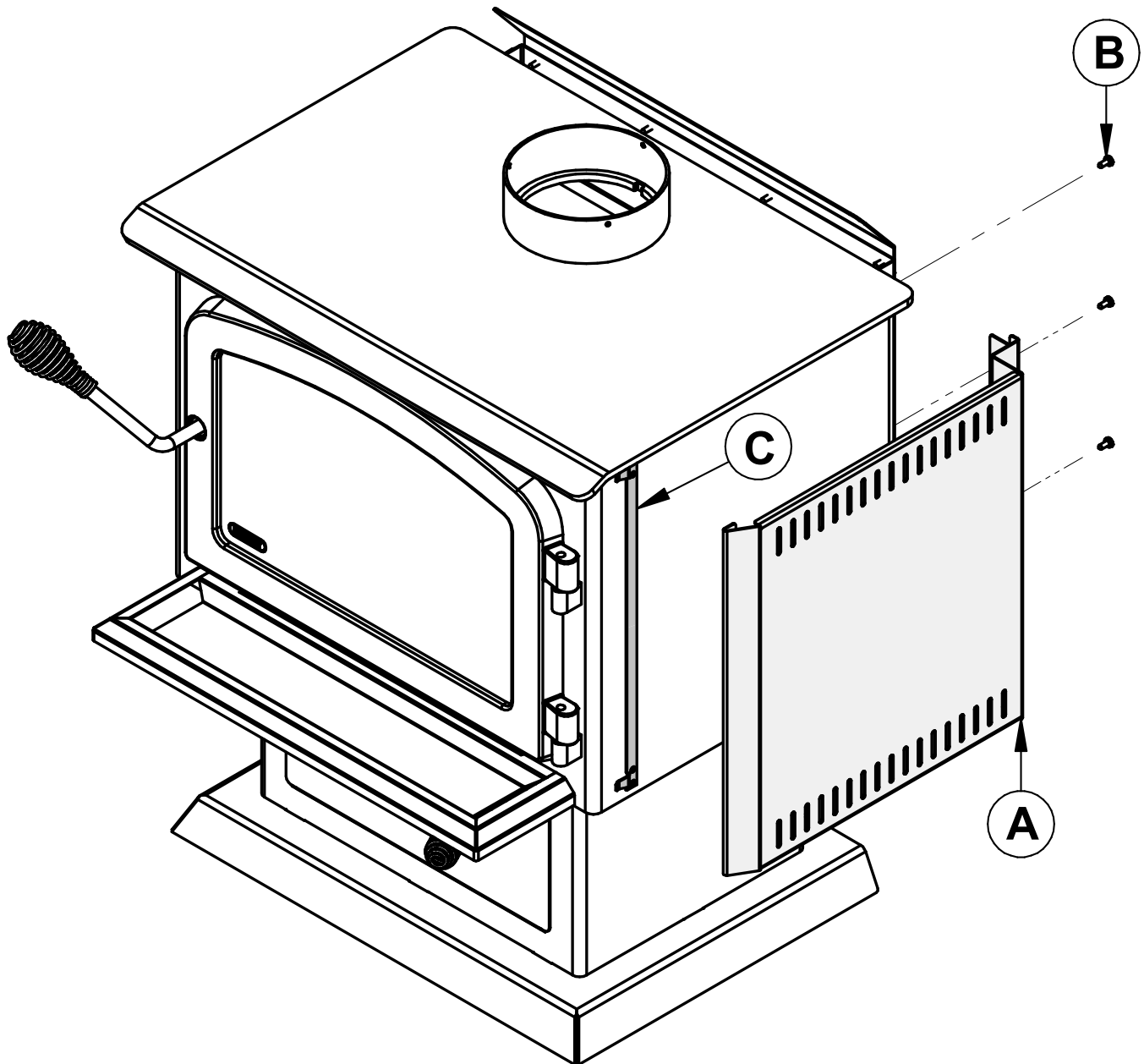
TYPE OF SHIELD	CLEARANCES MAY BE REDUCED BY THESE PERCENTAGES				
	SIDES AND REAR		TOP (CEILING)		
	CAN / USA (%)	USA MIN.	CAN / USA (%)	USA MIN.	
Sheet metal, a minimum of 24 gauge (0.61 mm) in thickness , spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	50	18" (457 mm)	
Ceramic tiles, or equivalent non-combustible material, on non-combustible board spaced out at least 1" (25 mm)* by non-combustible spacers	50	18" (457 mm)	33	24" (610 mm)	
Ceramic tiles, or equivalent non-combustible material, on non-combustible board, with a minimum of 24 gauge (0.61 mm) sheet metal backing spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	50	24" (610 mm)	
Brick, spaced out at least 1" (25 mm)* by non-combustible spacers	50	18" (457 mm)	N/A	N/A	
Brick, with a minimum of 24 gauge (0.61 mm) sheet metal backing, spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	N/A	N/A	

\* In Canada this space can be 7/8" (21 mm)

## 6. INSTALLATION OF OPTIONS ON YOUR PRODUCT

### 6.1 Decorative Panels

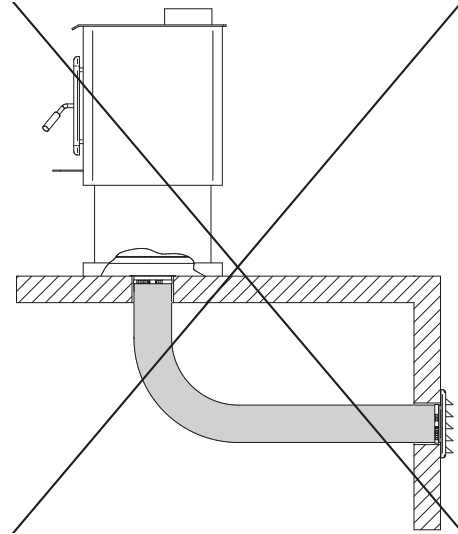
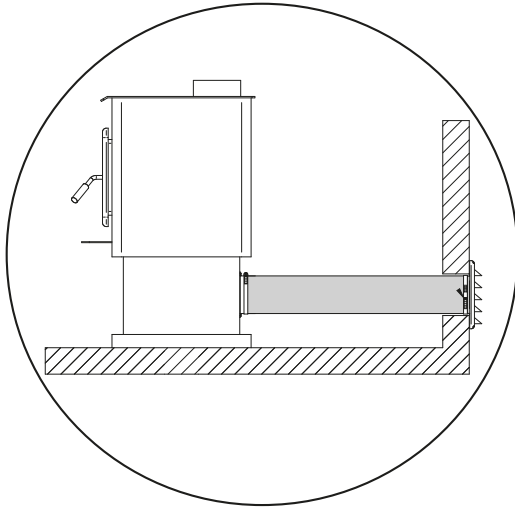
To remove the decorative panel **(A)**, remove the screws **(B)** and push forward on the panel to unhook it from the bracket **(C)**.



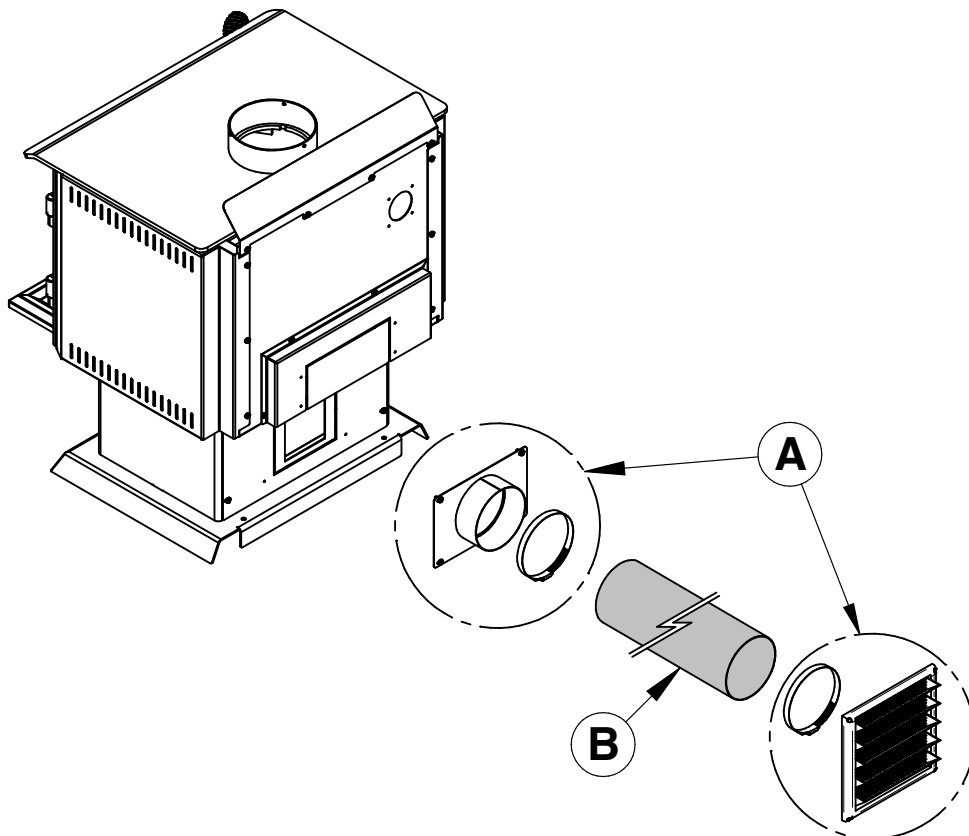
## 6.2 Optional Fresh Air Intake Kit Installation



The configuration of this appliance do not allow the air intake to be installed underneath the pedestal. It can only be installed on the back.



This mobile home approved stove requires the installation of a fresh air intake kit **(A)** and an insulated fresh air intake pipe (HVAC type, must meet ULC S110 or UL 181 class 0 or class 1) **(B)**, sold separately. Refer to air intake kit installation instructions for more details.

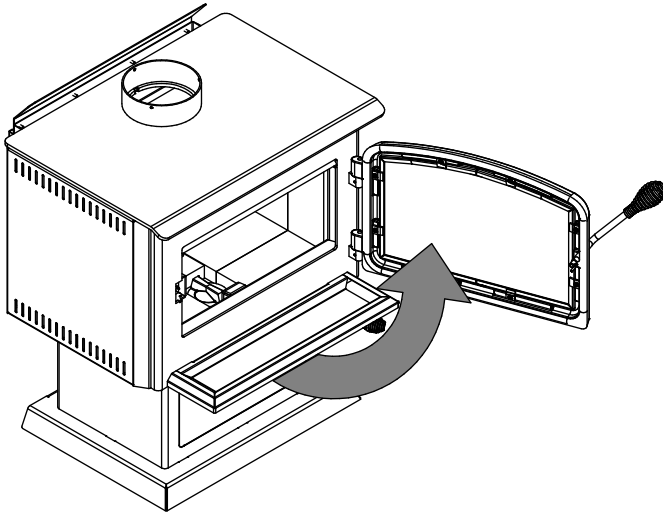


### 6.3 Optional Fire Screen Installation

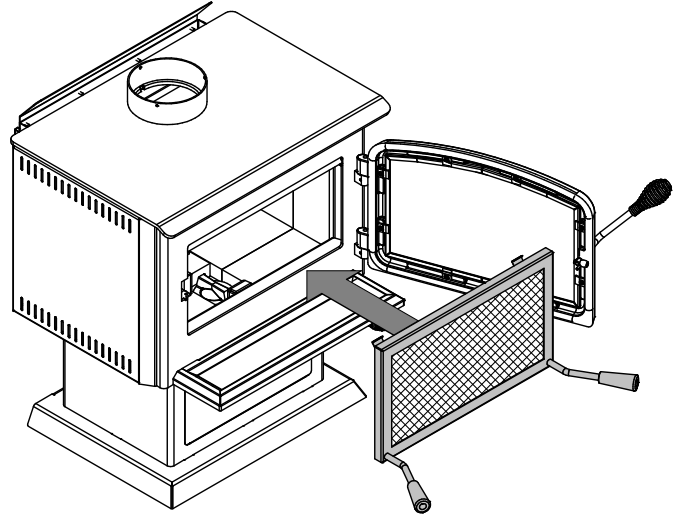
In the United States or in provinces with a particulate emission limit (eg. US EPA), the use of wood stoves with the door open with a rigid firescreen is prohibited.

It is prohibited to use this wood stove with a fire screen in a mobile home.

1. Open the door.



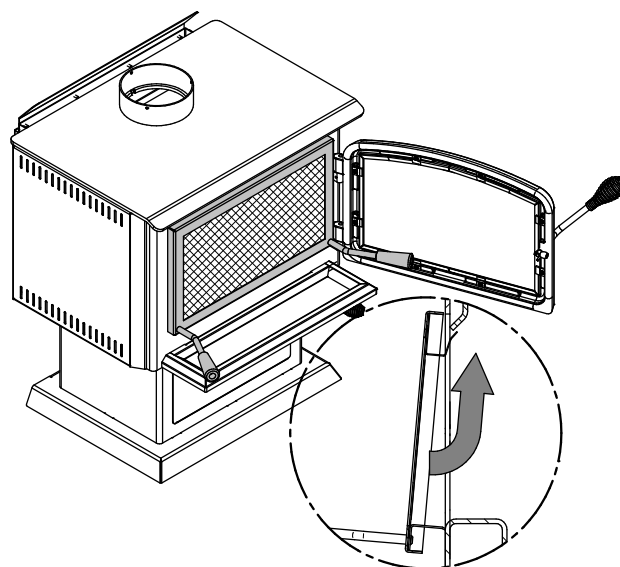
2. Hold the fire screen by the two handles and bring it close to the door opening.



3. Lean the upper part of the fire screen against the top door opening making sure to position the top fire screen brackets behind the primary air deflector.

4. Lift the fire screen upwards and push the bottom part towards the stove then let the fire screen rest on the bottom of the door opening.

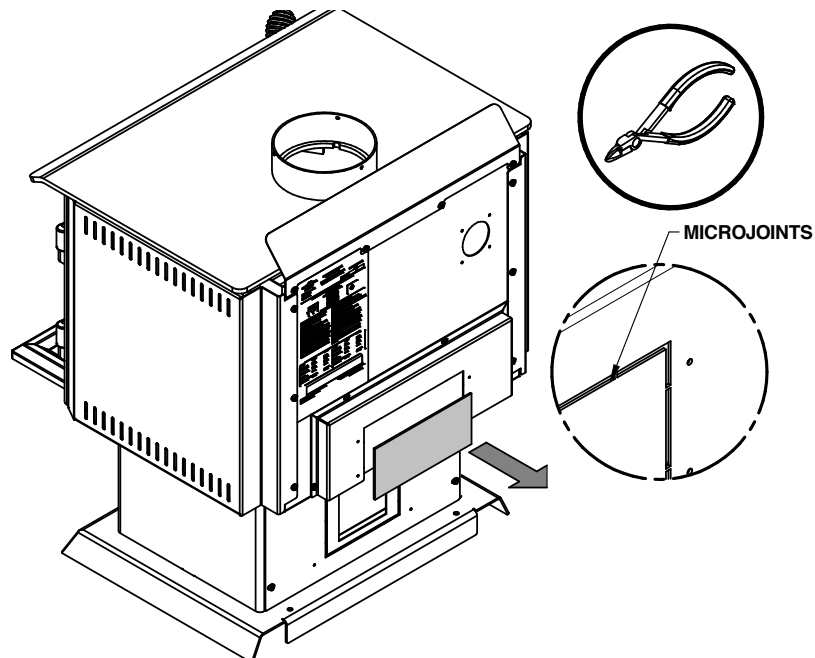
**Warning: Never leave the stove unattended while in use with the fire screen.**



## 6.4 Optional Blower Installation

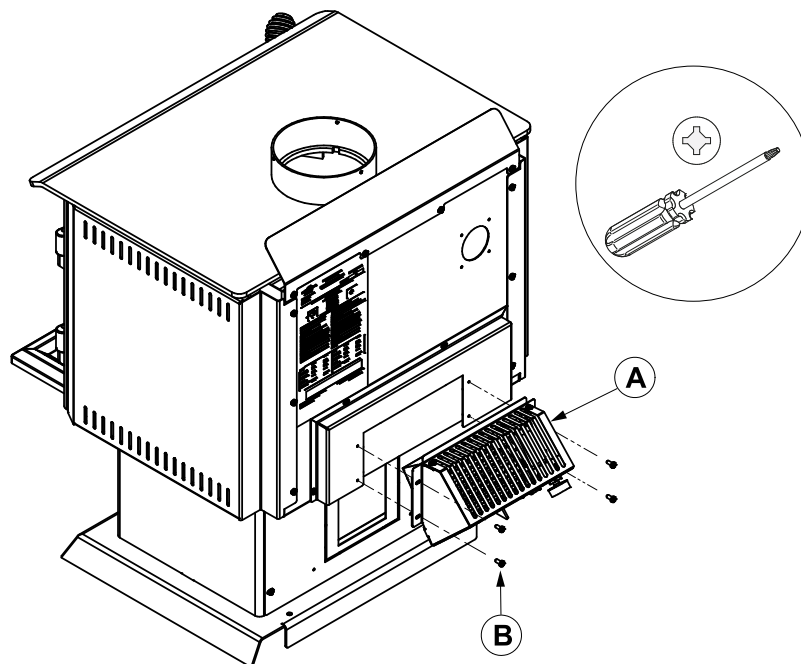
A blower, sold separately, can be installed on the stove.

1. Remove the backplate by cutting the knockouts with pliers.



2. Screw the blower (A) in place using the screws (B) included in the installation manual.

**Ensure that the blower's power cord is not in contact with any surface of the stove to prevent electrical shock or fire damage. Do not run the power cord beneath the stove**

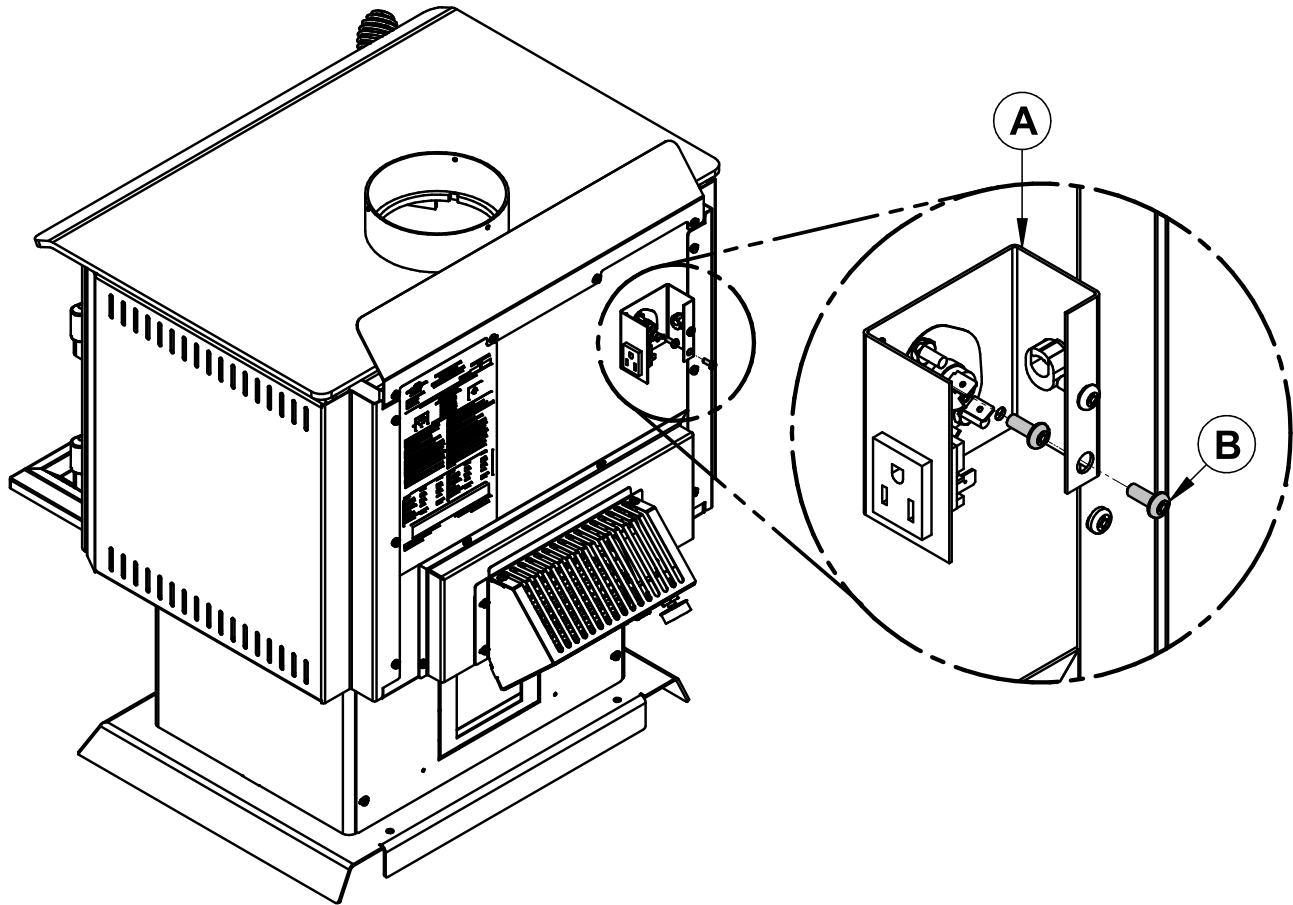


## 6.5 Optional Thermodisc Installation

A thermodisc, sold separately, can be installed with the blower. It allows the blower to operate only when the stove is hot enough. See the instructions provided with the thermodisc for more details.

1. Screw the thermodisc **(A)** with the screws **(B)** provided on the back of the stove.

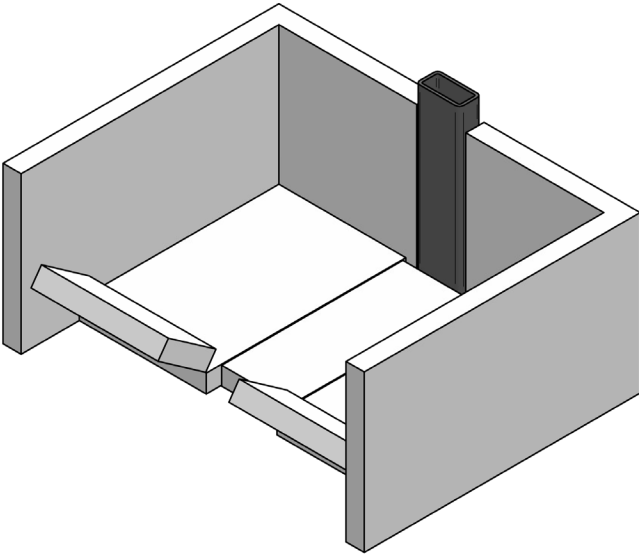
**The electrical cord of the thermodisc should not touch any surface of the stove to avoid electric shock or fire. Do not run the power cord under the stove.**



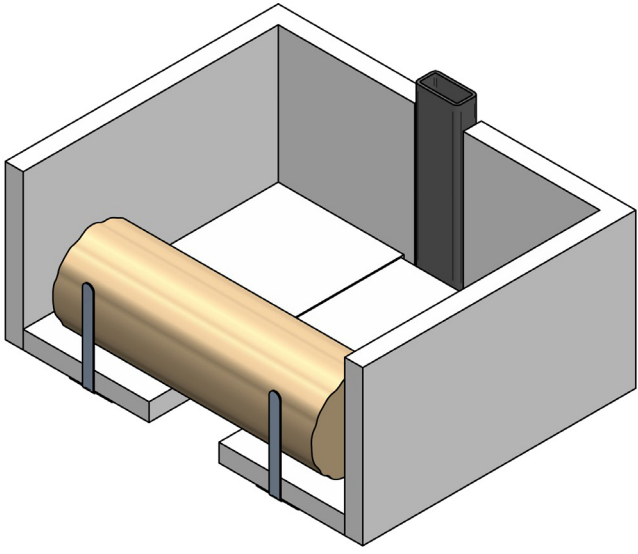


# 6.6 Log Retainers Installation

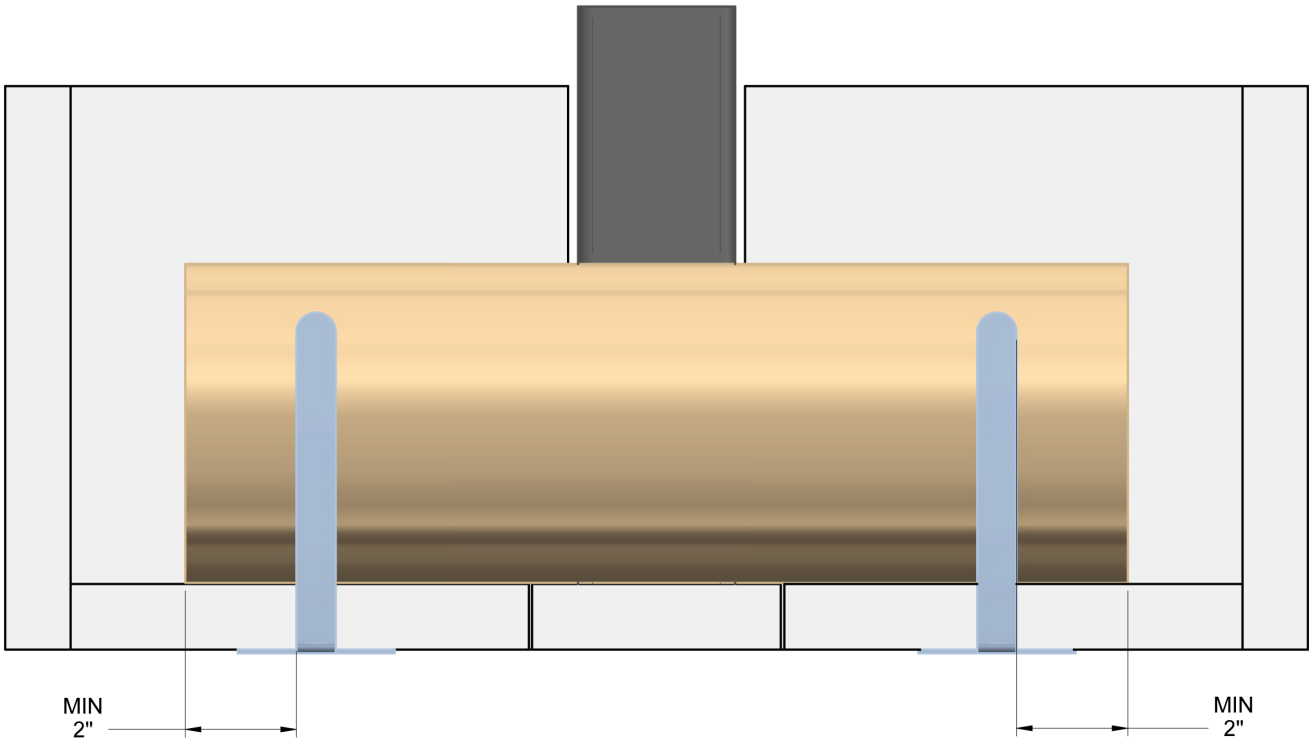
1.



2.



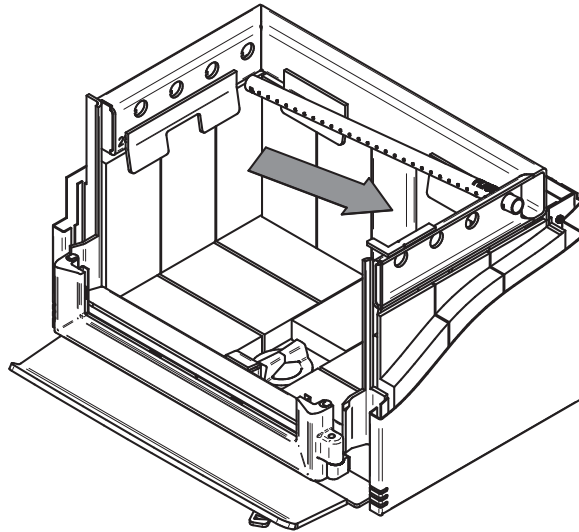
3.



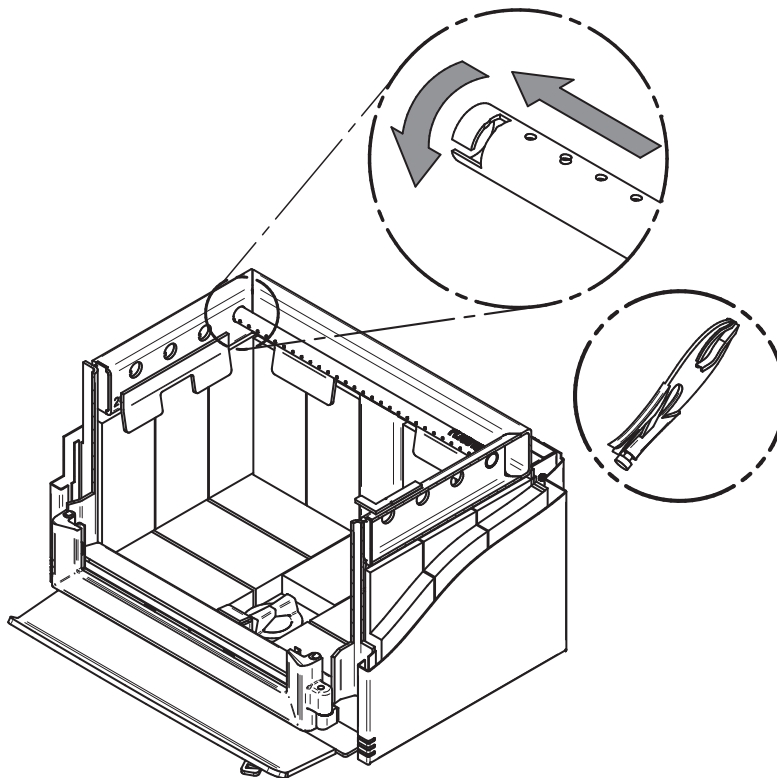
ENGLISH

## 6.7 Air Tubes And Baffle Installation

1. Starting with the rear tube, lean and insert the right end of the secondary air tube into the rear right channel hole. Then lift and insert the left end of the tube into the rear left channel.

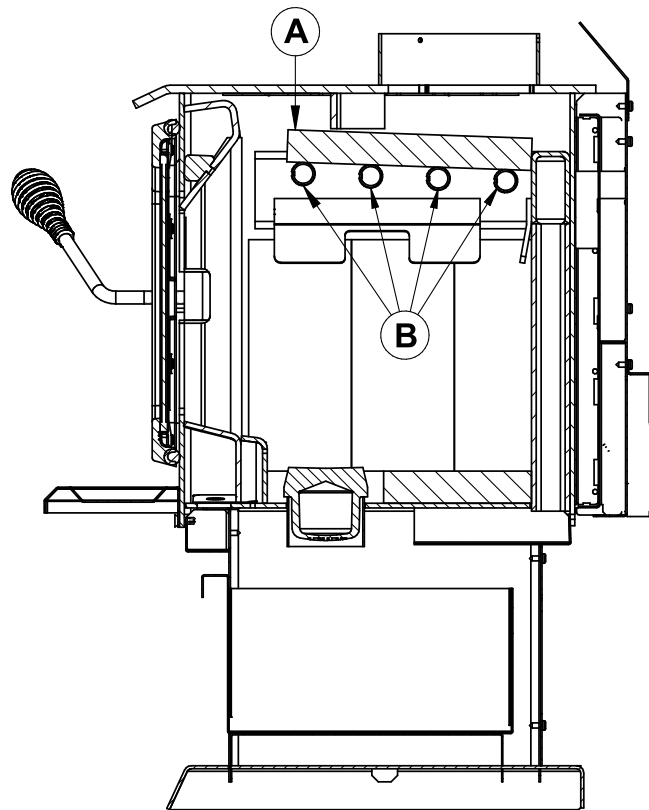
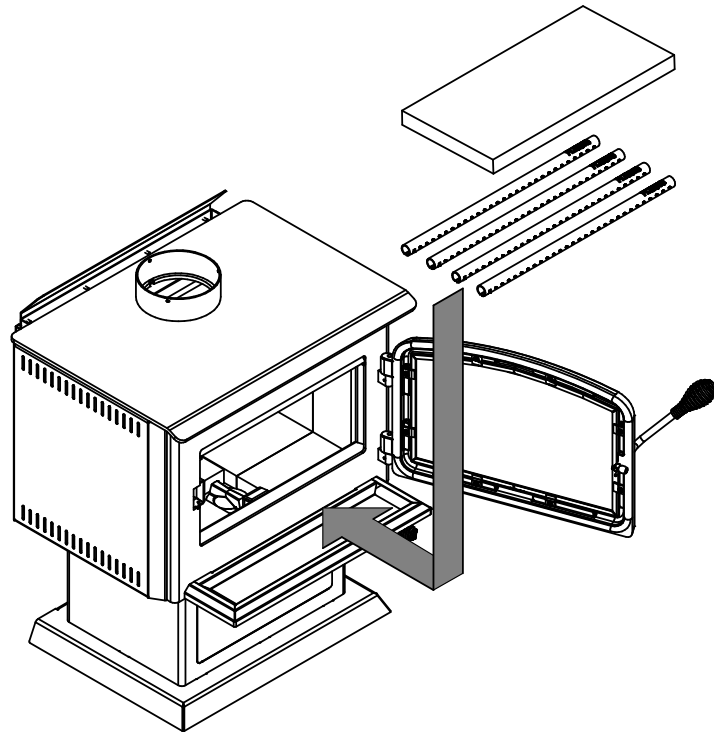


2. Align the notch in the left end of the tube with the key of the left air channel hole. Using a « Vise grip » hold the tube and lock it in place by turning the tube as shown. Make sure the notch reaches the end of the key way.



3. Put the baffle in place.
4. Repeat steps 1 and 2 for the three other tubes.
5. To remove the tubes use the above steps in reverse order.

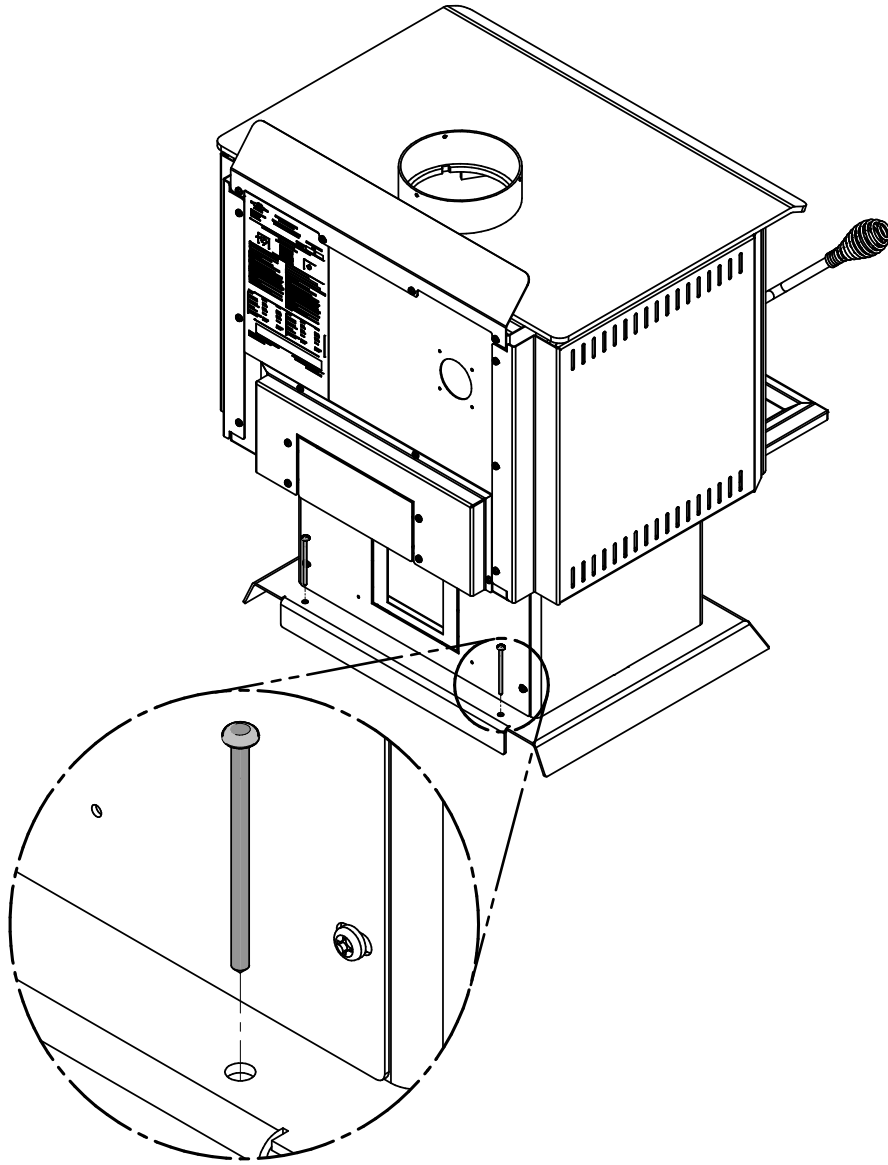
Note that secondary air tubes (B) can be replaced without removing the baffle board (A) and that all tubes are not necessarily identical (look at the part number on the tube).



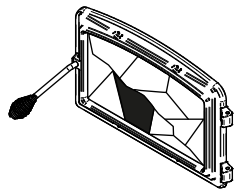
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## 6.8 Mobile Home Installation

Screw the base on the floor with the proper hardware.



## 7. Maintenance/Parts Replacement



**Do not clean the glass when the stove is hot.**

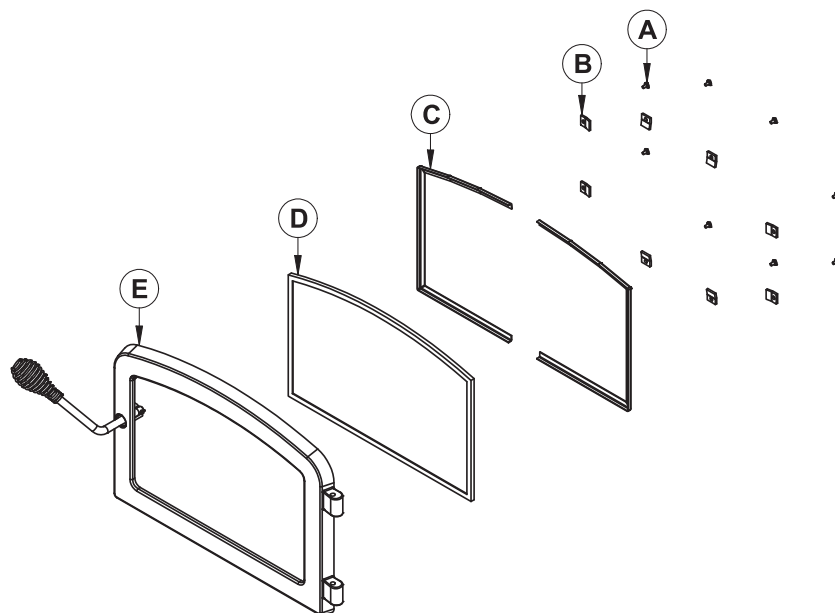
**Do not abuse the glass door by striking or slamming shut.**

**Do not use the stove if the glass is broken.**

### 7.1 Replacement

The glass used is a ceramic glass, 5/32" (4 mm) thick, 15 3/4" x 9 3/4" (400 mm x 248 mm), tested to reach temperatures up to 1400° F. If the glass breaks, it must be replaced by a ceramic glass from SCHOTT with the same specification. Contact your dealer to obtain a genuine replacement part.

**To remove or replace the glass (D):**



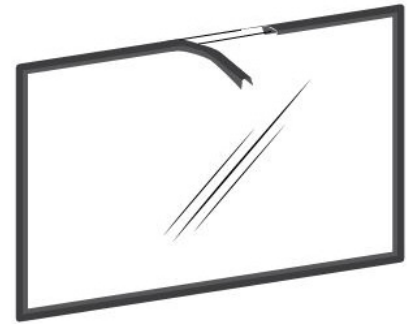
1. Remove the door **(E)** from its hinges and lay it on a soft, flat surface.
2. Remove the eight screws **(A)**, the eight glass retainers **(B)**, and the metal frames **(C)**.
3. Remove the glass **(D)**. If it is damaged install a new one in place. The replacement glass must have a gasket all around (see procedure below).
4. Reinstall the glass, being careful to centre the glass in the door and not to over-tightening the retaining screw.

*The two main causes of broken door glass are uneven placement in the door and over-tightening the retaining screws.*

## 7.2 Gasket

The glass gasket is flat, adhesive-backed, woven fibreglass. The gasket must be centred on the edge of the glass.

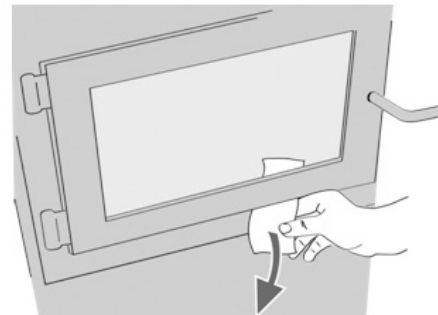
1. Follow the steps of the previous section to remove the glass.
2. Remove the old gasket and clean the glass thoroughly.
3. Peel back a section of the paper covering the adhesive and place the gasket on a table with the adhesive side up.
4. Stick the end of the gasket to the middle of one edge, then press the edge of the glass down onto the gasket, taking care that it is perfectly centred on the gasket.
5. Peel off more of the backing and rotate the glass. The gasket must not be stretched during installation.
6. Cut the gasket to the required length.
7. Pinch the gasket onto the glass in a U shape, all around the glass.



*By following these instructions, the edge clearances are maintain.*

## 7.3 Door

In order for the stove to burn at its best efficiency, the door must provide a perfect seal with the firebox. The tightness of the door seal can be verified by closing and latching the door on a strip of paper. The test must be performed all around the door. If the paper slips out easily anywhere, either adjust the door or replace the gasket.



### 7.3.1 Adjustment

In order for the stove to burn at its best efficiency, the door must provide a perfect seal with the firebox. Therefore, the gasket should be inspected periodically to check for a good seal. The gasket seal may be improved with a simple latch mechanism adjustment:

1. Remove the split pin by pulling and turning it using pliers.
2. Turn the handle one counterclockwise turn to increase pressure.
3. Reinstall the split pin with a small hammer.

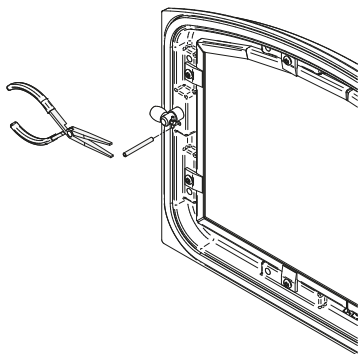


Figure 27: Removing the split pin

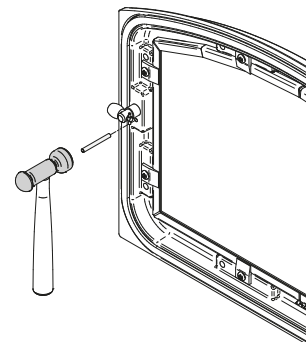
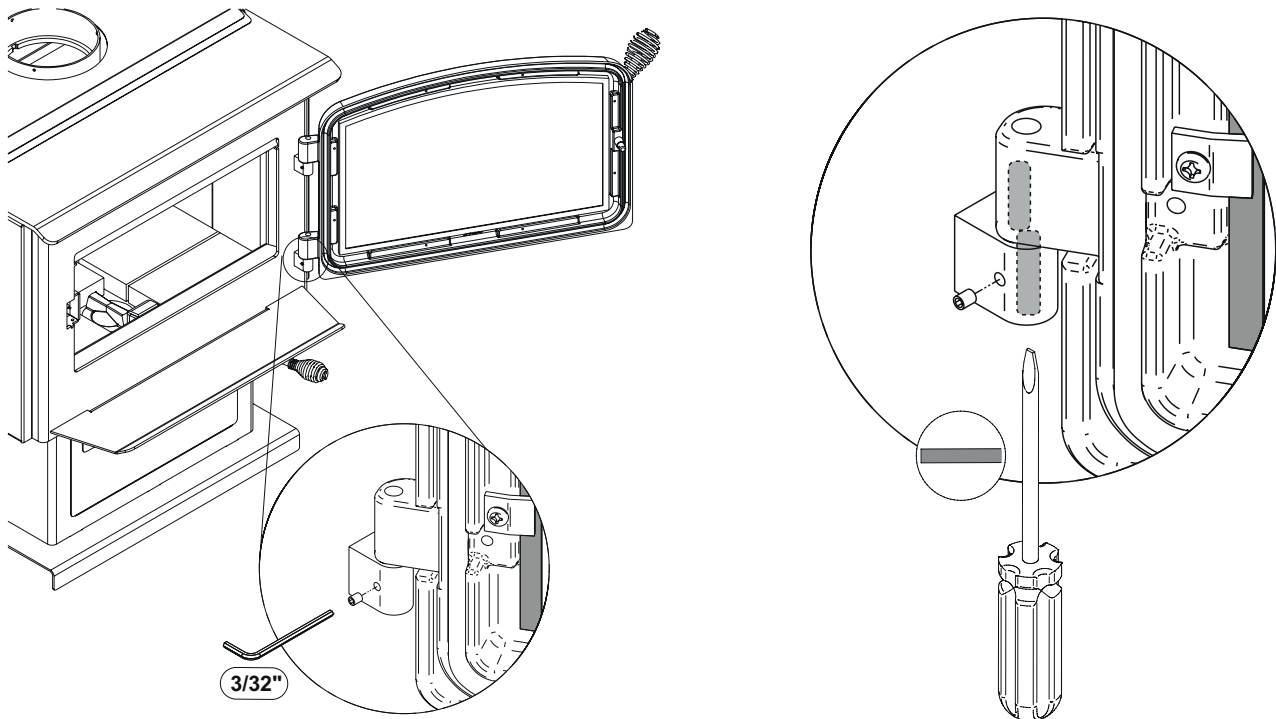


Figure 28: Installing the split pin

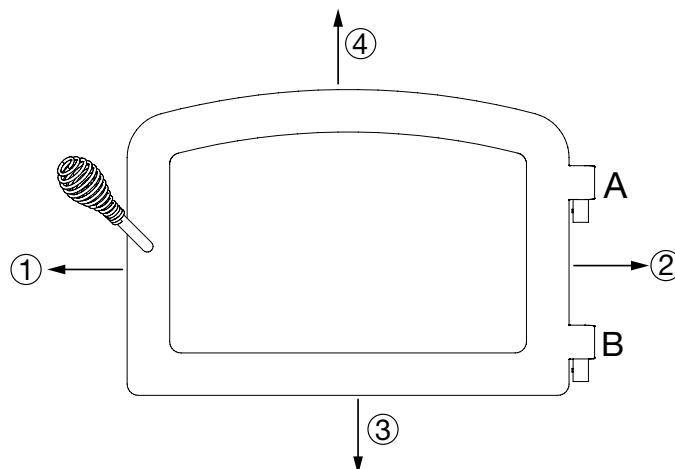
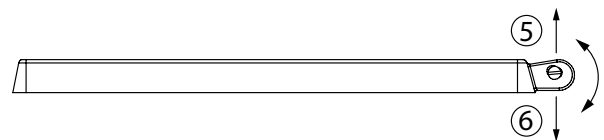
### 7.3.2 Door Alignment

To align, open the door and loosen the pressures screws located on the lower and upper hinges of the door using a 3/32" Allen key to free the adjustable hinge rods.



Using a flat screwdriver, turn the adjustable hinge rods in the direction shown to adjust the doors. Tighten all door hinge pressure screws when they are at the desired positions. Configurations 1-2-3-4-5-6, show in which direction these act on the adjustment of the door.

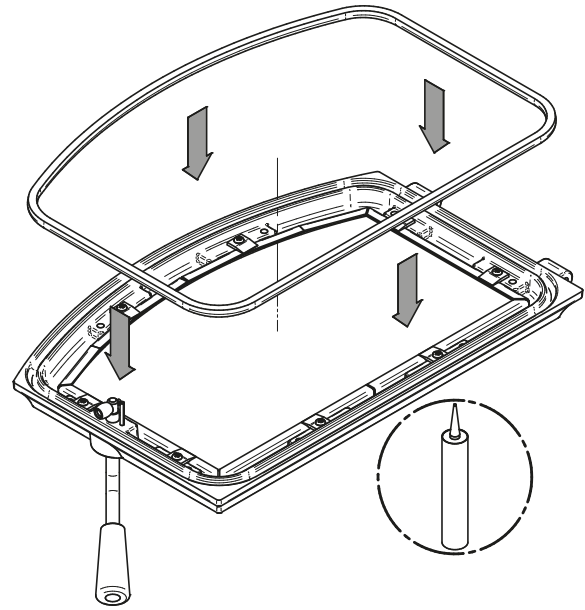
①	②	③	④
	A		A
	B		B



### 7.3.3 Gasket

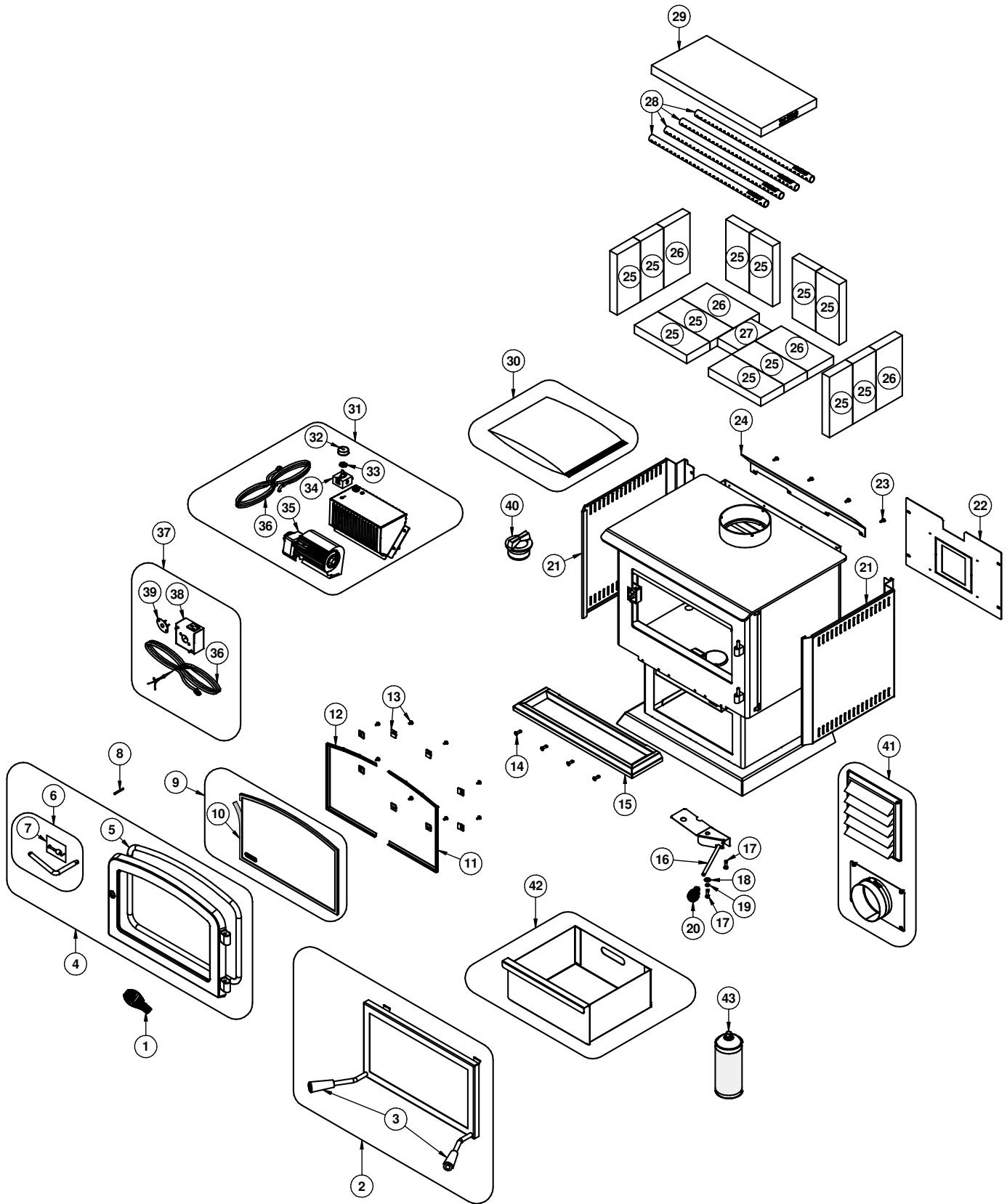
It is important to replace the gasket with another having the same diameter and density to maintain a good seal.

1. Remove the door and place it face-down on something soft like a cushion of rags or a piece of carpet.
2. Remove the old gasket from the door. Use a screwdriver to scrape the old gasket adhesive from the door gasket groove.
3. Apply a bead of approximately 3/16" (5 mm) of high temperature silicone in the door gasket groove. Starting from the middle, hinges side, press the gasket into the groove. The gasket must not be stretched during installation.
4. Leave about 1/2" long of the gasket when cutting and press the end into the groove. Tuck any loose fibers under the gasket and into the silicone.
5. Close the door. Do not use the stove for 24 hours.





# 8. Exploded Diagram and Parts List



ENGLISH

IMPORTANT: THIS IS DATED INFORMATION. When requesting service or replacement parts for your unit, please provide the model number and the serial number. We reserve the right to change parts due to technology upgrades or availability. Contact an authorized dealer to obtain any of these parts. Never use substitute materials. Use of non-approved parts can result in poor performance and safety hazards.

#	Item	Description	Qty
1	AC07867	1/2" CHROME PLATED COIL HANDLE	1
2	AC01299	RIGID FIRE SCREEN	1
3	30898	ROUND WOODEN BLACK HANDLE DULL BLACK FINISH	2
4	SE24300	CAST IRON DOOR WITH HANDLE AND GASKET	1
5	AC06500	SILICONE AND 5/8" X 8' BLACK DOOR GASKET KIT	1
6	SE70697	REPLACEMENT HANDLE WITH LATCH KIT	1
7	AC09185	DOOR LATCH KIT	1
8	30101	SPRING TENSION PIN 5/32"Ø X 1 1/2"L	1
9	SE70700	REPLACEMENT GLASS WITH GASKET ESCAPE 1500	1
10	AC06400	3/4" (FLAT) X 6' BLACK SELF-ADHESIVE GLASS GASKET	1
11	PL70675	RIGHT GLASS FRAME	1
12	PL70676	LEFT GLASS FRAME	1
13	SE53585	GLASS RETAINER KIT WITH SCREWS (12 PER KIT)	1
14	30507	BLACK TORX SCREW WITH FLAT HEAD TYPE F 1/4-20 X 3/4"	4
15	PL70708	ASH SHELF	1
16	SE70618	AIR CONTROL DAMPER ASSEMBLY	1
17	30506	SCREW PAN TORX TYPE F 1/4-20 X 1" BLACK	2
18	30206	ZINC WASHER 5/16"ID X 3/4"OD	1
19	30187	STAINLESS WASHER ID 17/64" X OD 1/2"	1
20	30429	3/8" NICKEL COIL HANDLE	1
21	PL70706	DECORATIVE PANEL	2
22	PL70562	PIEDESTAL BACK PANEL	1
23	30154	BLACK SCREW #10 X 5/8" QUADREX #2 TYPE A	4
24	PL70713	AIR DEFLECTOR	1
25	29015	4" X 9" X 1 1/4" REFRACTORY BRICK	12
26	29010	4 1/2" X 9" X 1 1/4" REFRACTORY BRICK	4
27	PL36274	3.625" X 5.75" X 1 1/4" REFRACTORY BRICK	1
28	PL70516	SECONDARY AIR TUBE	4
29	21586	VERMICULITE BAFFLE	1
30	SE46146	BLACKCOMB II OWNER'S MANUEL KIT	1
31	AC02050	BLOWER ASSEMBLY WITH VARIABLE SPEED CONTROL (UP TO 100 CFM)	1
32	44085	RHEOSTAT KNOB	1
33	44087	RHEOSTAT NUT	1
34	44080	RHEOSTAT WITHOUT NUT (MODEL KBMS-13BV)	1
35	44073	CROSSFLOW BLOWER 115V-60Hz-39W 100 CFM	1

#	Item	Description	Qty
36	60013	POWER CORD 96" X 18-3 type SJT (50 pcs per carton)	1
37	AC02055	QUICK CONNECT THERMODISC KIT	1
38	PL05530-02	THERMODISC BOX (COVER)	1
39	44028	CERAMIC THERMODISC F110-20F	1
40	24096	ROUND CAST IRON ASH PLUG	1
41	AC01336	5"Ø FRESH AIR INTAKE KIT FOR WOOD STOVE ON PEDESTAL	1
42	PL65960	ASH PAN	1
43	AC05959	METALLIC BLACK STOVE PAINT - 342 g (12oz) AEROSOL	1

# DROLET LIMITED LIFETIME WARRANTY

The warranty of the manufacturer extends only to the original retail purchaser and is not transferable. This warranty covers brand new products only, which have not been altered, modified nor repaired since shipment from the factory. Proof of purchase (dated bill of sale), model name and serial number must be supplied when making any warranty claim to the DROLET dealer.

This warranty applies to normal residential use only. This warranty is void if the unit is used to burn material other than cordwood (for which the unit is not certified by EPA) and void if not operated according to the owner's manual. Damages caused by misuse, abuse, improper installation, lack of maintenance, over firing, negligence or accident during transportation, power failures, downdrafts, venting problems or underestimated heating area are not covered by this warranty. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure.

This warranty does not cover any scratch, corrosion, distortion, or discoloration. Any defect or damage caused by the use of unauthorized or other than the original parts voids this warranty. An authorized qualified technician must perform the installation in accordance with the instructions supplied with this product and all local and national building codes. Any service call related to an improper installation is not covered by this warranty.

The manufacturer may require that defective products be returned or that digital pictures be provided to support the claim. Returned products are to be shipped prepaid to the manufacturer for investigation. Transportation fees to ship the product back to the purchaser will be paid by the manufacturer. Repair work covered by the warranty, executed at the purchaser's domicile by an authorized qualified technician requires the prior approval of the manufacturer. All parts and labour costs covered by this warranty are limited according to the table below.

The manufacturer, at its discretion, may decide to repair or replace any part or unit after inspection and investigation of the defect. The manufacturer may, at its discretion, fully discharge all obligations with respect to this warranty by refunding the wholesale price of any warranted but defective parts. The manufacturer shall, in no event, be responsible for any uncommon, indirect, consequential damages of any nature, which are in excess of the original purchase price of the product. A one-time replacement limit applies to all parts benefiting from lifetime coverage. This warranty applies to products purchased after March 1<sup>st</sup> 2019.

DESCRIPTION	WARRANTY APPLICATION*	
	PARTS	LABOUR
Combustion chamber (welds only) and cast iron door frame.	Lifetime	3 years
Surrounds, heat shields, ash drawer, steel legs, pedestal, trims (aluminum extrusions), plating (defective manufacture**), and convector air-mate.	5 years	3 years
Removable stainless steel combustion chamber components, secondary air tubes**, deflectors, and supports.	5 years	N/A
Glass retainers, handle assembly, and air control mechanism.	3 years	1 year
Carbon steel combustion chamber components, vermiculite baffle**, and C-Cast baffle**.	2 years	N/A
Standard blower, heat sensors, switches, rheostat, wiring, and other controls.	1 year	1 year
Optional blower, paint (peeling**), ceramic glass (thermal breakage only**), ceramic fibre blankets, gaskets, insulation, and other options.	1 year	N/A
Firebricks.	N/A	N/A
All parts replaced under the warranty.	90 days	N/A

\*Subject to limitations above.    \*\*Picture required.

Labour cost and repair work to the account of the manufacturer are based on a predetermined rate schedule and must not exceed the wholesale price of the replacement parts. Shall your unit or a component be defective, contact immediately your DROLET dealer. To accelerate processing of your warranty claim, make sure to have on hand the following information when calling:

- Your name, address and telephone number;
- Bill of sale and dealer's name;
- Installation configuration;
- Serial number and model name as indicated on the nameplate fixed to the back of your unit;
- Nature of the defect and any relevant information.

***Before shipping your unit or defective component to our plant, you must obtain an Authorization Number from your DROLET dealer. Any merchandise shipped to our plant without authorization will be refused automatically and returned to the sender.***



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Stove Builder International inc.  
250, rue de Copenhague,  
St-Augustin-de-Desmaures (Québec) Canada  
G3A 2H3  
1-877-356-6663  
<https://www.drolet.ca/us/en/>  
[tech@sbi-international.com](mailto:tech@sbi-international.com)



# CERTIFICATE OF CALIBRATION



Certificate Number: 2023001259

Page 1 of 2

<b>Manufacturer:</b>	Dwyer Instruments Inc.	<b>RMA:</b>	AC23021162
<b>Model:</b>	MS-121-LCD	<b>Workorder:</b>	2023001259
<b>Description:</b>	Digital Pressure Gauge	<b>Barcode:</b>	AL0015073-P
<b>Serial:</b>	E52U01007411	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	SBI-248	<b>Calibration Date:</b>	27-Feb-2023
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	27-Feb-2024
		<b>Temperature:</b>	22.12°C
		<b>Humidity:</b>	15.5%RH

**STATEMENT OF UNCERTAINTY:** The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor  $K = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST /NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCCL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

Functional tests are not covered by our scope of accreditation.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Multimeter	Fluke 8845A	ELC-MTR-04	21-Feb-2023	21-Feb-2024
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	07-Mar-2022	31-Mar-2023

**Notes:** None.

Performed by:

Anthony Morra

Technician

(digitally signed on 27-Feb-2023 12:22 pm)

QA Reviewed by:

Slava Peciurov

Lab Manager

(digitally signed on 27-Feb-2023 3:29 pm)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

Procedure: Dwyer MS-121-LCD: 0-0.25 inH2O /7520LP,8845A (1.0.A)

Found / Left (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Range: 0 to 0.25 inH2O							
Output signal: 4 to 20 mA							
<b>PRESSURE TEST</b>							
Display Reading						-0.004	
Output @ 0.0000 inH2O, mA						3.996	
0.0000 inH2O	0.0000 inH2O	-0.0005 inH2O	±0.0025 inH2O	-0.0025 inH2O	0.0025 inH2O	Pass	1.5e-004 inH2O
Display Reading						.0610	
Output @ 0.0625 inH2O, mA						7.85	
0.0625 inH2O	0.0625 inH2O	0.0610 inH2O	±0.0025 inH2O	0.0600 inH2O	0.0650 inH2O	Pass	1.5e-004 inH2O
Display Reading						.123	
Output @ 0.1250 inH2O, mA						11.85	
0.1250 inH2O	0.1250 inH2O	0.1230 inH2O	±0.0025 inH2O	0.1225 inH2O	0.1275 inH2O	Pass	1.5e-004 inH2O
Display Reading						.1865	
Output @ 0.1875 inH2O, mA						15.851	
0.1875 inH2O	0.1875 inH2O	0.1865 inH2O	±0.0025 inH2O	0.1850 inH2O	0.1900 inH2O	Pass	1.5e-004 inH2O
Display Reading						.2486	
Output @ 0.2500 inH2O, mA						19.852	
0.2500 inH2O	0.2500 inH2O	0.2485 inH2O	±0.0025 inH2O	0.2475 inH2O	0.2525 inH2O	Pass	1.5e-004 inH2O
Display Reading						.1864	
Output @ 0.1875 inH2O, mA						15.892	
0.1875 inH2O	0.1875 inH2O	0.1864 inH2O	±0.0025 inH2O	0.1850 inH2O	0.1900 inH2O	Pass	1.5e-004 inH2O
Display Reading						.1231	
Output @ 0.1250 inH2O, mA						11.856	
0.1250 inH2O	0.1250 inH2O	0.1231 inH2O	±0.0025 inH2O	0.1225 inH2O	0.1275 inH2O	Pass	1.5e-004 inH2O
Display Reading						0.061	
Output @ 0.0625 inH2O, mA						7.921	
0.0625 inH2O	0.0625 inH2O	0.0610 inH2O	±0.0025 inH2O	0.0600 inH2O	0.0650 inH2O	Pass	1.5e-004 inH2O
Display Reading						-0.002	
Output @ 0.0000 inH2O, mA						3.996	
0.0000 inH2O	0.0000 inH2O	-0.0002 inH2O	±0.0025 inH2O	-0.0025 inH2O	0.0025 inH2O	Pass	1.5e-004 inH2O

END OF CERTIFICATE



Mettler-Toledo Inc.  
Service Division  
1900 Polaris Parkway  
Columbus, OH 43240  
1-800-METTLER



Accrédité par le "American Association  
for Laboratory Accreditation (A2LA)"  
CERTIFICAT D'ÉTALONNAGE #1902.01

ISO 17025 Registered  
ANSI/NCSL Z540-1 Accredited

## Certificat d'étalonnage ACC

Accuracy Calibration Certificate

### Client

**Société:** SBI Fabricant De Poeles  
**Adresse:** 250 rue de Copenhague  
**Ville:** Saint-Augustin-de-Desmaures **Contact:** André Bouchard  
**Code Postal:** G3A 2H3  
**Région:** Quebec

### Appareil de pesage

**Constructeur:** Ohaus **Type d'instrument:** Instrument de pesage  
**Modèle:** FD15 **N° inventaire:** SBI-222 BALANCE BENCH  
**N° de série:** B144397174 **Modèle Terminal:** N/A  
**Bâtiment:** N/A **N° de série Terminal:** N/A  
**Étage:** N/A **N° inventaire Terminal:** N/A  
**Pièce:** N/A

Étendue	Portée Max.	Résolution (d)
1	15000 g	1 g

### Procédure

**Instruction d'étalonnage :** ASTM E898 - 20  
**Instruction de travail :** 30260953

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

Ce certificat d'étalonnage contient des mesures pour l'étalonnage Avant réglage. Aucun étalonnage Après réglage n'a été effectué car l'instrument n'a pas été modifié suite à l'étalonnage Avant réglage. Par conséquent, les résultats Après réglage correspondent aux résultats Avant réglage.

	Température		Humidité		Les conditions ambiantes ont été vérifiées pour s'assurer de l'exactitude de l'étalonnage.
Avant réglage	Début: 22.7 °C	Fin: 22.9 °C	Début: 27.0 %	Fin: 27.0 %	

Ce certificat est délivré conformément aux conditions d'accréditation accordées par l'A2LA, sur la base de la norme ISO/IEC 17025. L'A2LA a évalué la capacité de mesure du laboratoire et sa traçabilité aux étalons nationaux reconnus.

**Date étal. Avant réglage :** 16-03-2023 **Signataire autorisé A2LA :**   
**Date étal. Après réglage :** N/A  
**Date d'édition :** 16-03-2023  
**Date demandée proch. étalonnage :** 31-03-2024  
Dany Careau

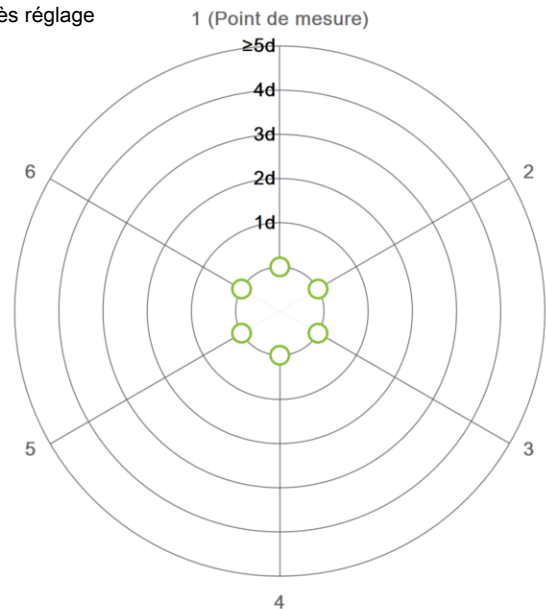
## Résultats de mesure

### Répétabilité

Charge d'essai: 10000 g

	Avant réglage	Après réglage
1	10000 g	N/A
2	10000 g	N/A
3	10000 g	N/A
4	10000 g	N/A
5	10000 g	N/A
6	10000 g	N/A

○ Avant réglage  
◆ Après réglage



Écart-type	0.0 g	N/A
------------	-------	-----

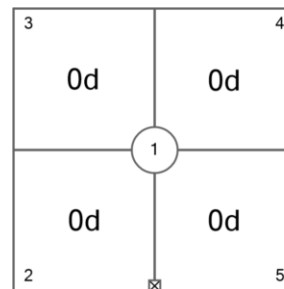
Le "d" dans le graphique représente la résolution de l'étendue/échelel dans lequel l'essai a été effectué.

Les résultats de ce graphique sont basés sur les valeurs absolues des différences par rapport à la valeur moyenne.

### Excentration

Charge d'essai: 5000 g

Position	Avant réglage	Après réglage
1	5000 g	N/A
2	5000 g	N/A
3	5000 g	N/A
4	5000 g	N/A
5	5000 g	N/A



Écart maximal	0 g	N/A
---------------	-----	-----

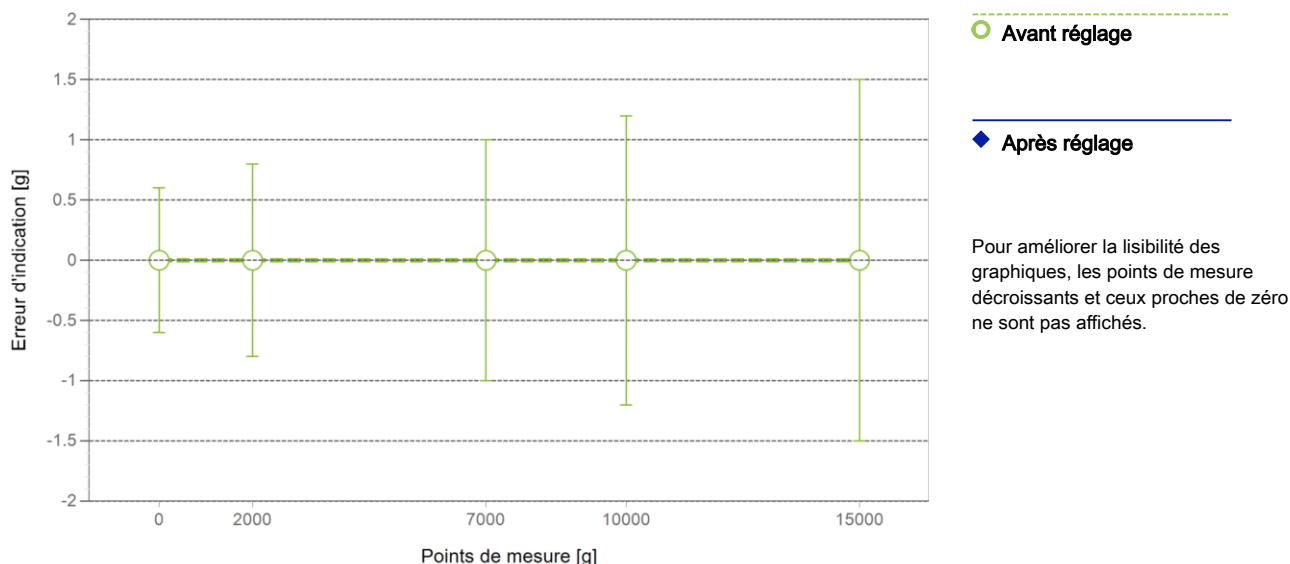
Avant réglage

Le "d" dans le graphique représente la résolution de l'étendue/échelel dans lequel l'essai a été effectué.

### Erreur d'indication

Avant réglage

	Valeur Référence	Indication	Erreur d'indication	Incertitude élargie	k
1	0 g	0 g	0 g	0.6 g	2
2	2000 g	2000 g	0 g	0.8 g	2
3	7000 g	7000 g	0 g	1.0 g	2
4	10000 g	10000 g	0 g	1.2 g	2
5	15000 g	15000 g	0 g	1.5 g	2



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

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

## Équipement d'essai

Tous les poids utilisés pour le contrôle métrologique sont raccordés aux étalons nationaux et internationaux. Les poids sont étalonnés par un laboratoire accrédité.

### Série de Poids 1: OIML M1

N° série de poids :	42265	Date d'édition :	29-08-2022
N° Certificat :	M21-0198	Date proch. étalonnage :	29-08-2023

## Remarques

N/A

### Fin de la partie Étalonnage

L'information ci-après et les annexes à ce certificat d'étalonnage ne font pas partie du domaine d'accréditation.

## Incertitude de mesure de l'instrument de pesage en utilisation

Établie à partir de l'incertitude élargie en utilisation avec  $k = 2$ . La formule sera utilisée pour estimer l'incertitude en prenant en compte les erreurs d'indication. La valeur R représente l'indication de la charge nette selon l'unité de mesure de l'appareil.

Coefficient de température pour l'évaluation de l'incertitude en utilisation :  $10.0 \cdot 10^{-6} / K$

Étendue de température sur site pour l'évaluation de l'incertitude en utilisation : 10 K

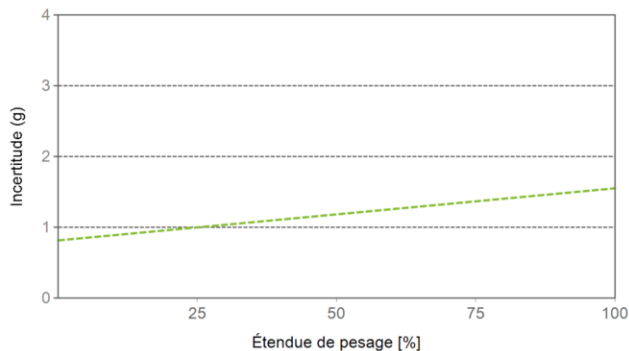
### Linéarisation de l'équation d'incertitude

Étendue			Avant réglage	Après réglage
	d	Max		
1	1 g	15000 g	$U_1 = 816 \text{ mg} + 0.0491 \text{ mg/g} \cdot R$	N/A

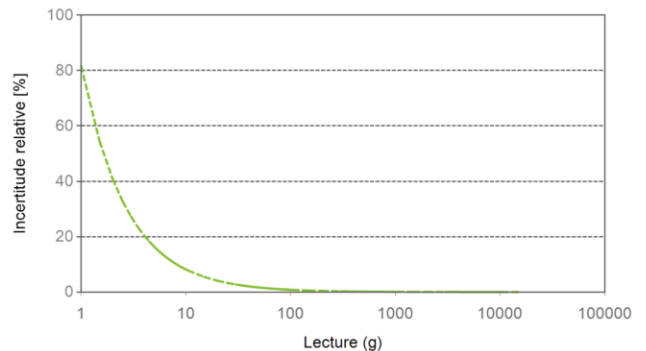
Pour optimiser la stabilité de la linéarisation, en plus du zéro, les points de mesure croissants avec une charge supérieure à 5% de la plage de mesure ou plus sont retenus pour calculer l'équation linéaire.

### Incertitude de mesure absolue et relative en utilisation pour diverses indications nettes (exemples)

Indication Nette	Avant réglage		Après réglage	
15 g	0.82 g	5.4%	N/A	N/A
150 g	0.82 g	0.55%	N/A	N/A
1500 g	0.89 g	0.059%	N/A	N/A
7500 g	1.2 g	0.016%	N/A	N/A
15000 g	1.6 g	0.010%	N/A	N/A



Avant réglage



Après réglage

# Évaluation selon les tolérances du HB 44 (Maintenance)

Évaluation effectuée sans tenir compte de l'incertitude de mesure

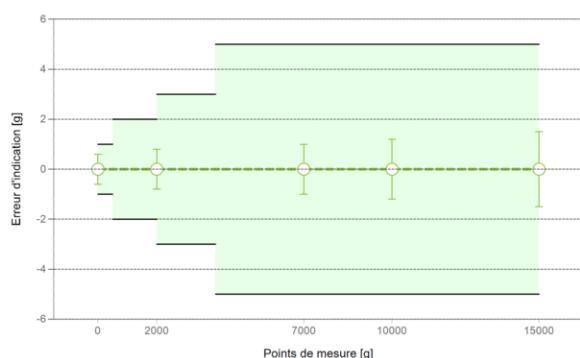
Les mesures du certificat d'étalonnage joint ont été évaluées selon les tolérances définies dans le HB44 du NIST. L'étendue des mesures pour les essais de répétabilité et d'excentration (si réalisé) est comparée aux tolérances de maintenance.

**Avant réglage**                      **Après réglage**

**Global**                      ✔                      N/A                      ✔ = Réussi  
✘ = Échec

## Appareil de pesage

Étendue	Portée Max.	Résolution (d)	Échelon de vérification (e)	Classe
1	15000 g	1 g	1 g	III



Tolérances définies dans le HB 44 du NIST

Charge d'essai		Tolérance
De	jusqu'à	
0 g	0 g	0.25 g
1 g	500 g	1 g
501 g	2000 g	2 g
2001 g	4000 g	3 g
4001 g	15000 g	5 g

○ Avant réglage

◆ Après réglage

— Tolérance

## Excentration et Répétabilité

Essai	Charge d'essai	Tolérance	Avant réglage		Après réglage	
			Erreur max. / Étendue	Résultat	Erreur max. / Étendue	Résultat
Excentration (Erreur max.)	5000 g	5 g	0 g	✔	N/A	N/A
Excentration (Étendue)	5000 g	5 g	0 g	✔	N/A	N/A
Répétabilité (Erreur max.)	10000 g	5 g	0 g	✔	N/A	N/A
Répétabilité (Étendue)	10000 g	5 g	0 g	✔	N/A	N/A

**Erreur max. :** Maximum des valeurs absolues of erreurs individuelles.

**Étendue :** Différence entre la plus grande et la plus valeur de mesure.

## Erreur d'indication

	Valeur référence	Tolérance	Avant réglage		Après réglage	
			Erreur d'indication	Résultat	Erreur d'indication	Résultat
1	0 g	1 g	0 g	✔	N/A	N/A
2	2000 g	2 g	0 g	✔	N/A	N/A
3	7000 g	5 g	0 g	✔	N/A	N/A
4	10000 g	5 g	0 g	✔	N/A	N/A
5	15000 g	5 g	0 g	✔	N/A	N/A



Digital Measurement Metrology Inc.

A Trescal company
26 Automatic Road, Unit 4
Brampton, ON, L6S 5N7
Tel. (905) 790-9400 Fax. (905) 790-9266
www.dmm.ca // service@dmm.ca



CALIBRATION CERTIFICATE

Table with calibration details: Description: WEIGHT, Asset Number: SBI-190, Calibration Date: Oct 02, 2018, Certificate: 95513, Property of: SBI ST-AUGUSTIN, Address: 250, rue de Copenhagen, Doors 10-12, City/Prov/PC: St-Augustin-de-Desmaures QC G3A 2H3, Country: Canada, Method Used: COMPARISON, Conformance Stds: ISO/IEC 17025: 2005

CALIBRATION DATA

Units: kg

Table with calibration data: Range, Std/Nominal, As Found, As Left, Min, Max, Tolerance In Out, Comments. Values: Range 5, Std/Nominal 5.0005, As Found 5.0005, As Left 5.0005, Min 4.9995, Max 5.0005, Tolerance In Out checkmark.

Remarks:

Inspected, cleaned and tested using the mfr's specs and procedures, customer's, national or international standards, or new procedure design. Measurement uncertainty is not included when any statement of compliance is made. The user must decide on acceptance for the intended use.

CALIBRATION STANDARD(S) USED

Received Condition:

In tolerance.

Table with calibration standards: Traceable No., Asset Number, Calibration Date, Date Due. Values: 95457, DMML-2356075, Oct 01, 2018, Oct 01, 2019; W-046636-25724, DMML-21701, Jan 08, 2018, Jan 08, 2020

Weights are accurate to class F tolerance.

Estimated measurement uncertainty is ± 0.2 g.

Reported uncertainties represent a 95 % confidence level assuming a normal distribution, with a coverage factor of k=2.

This calibration was performed in the lab and is traceable to the International System of Units (SI Units) through NIST or NRC. This report is covered by our accreditation.

Calibration of the instrument expires on Oct 02, 2023

The results shown above relate to the above calibrated instrument/equipment only. Copyright of this Certificate is owned by the issuing laboratory and may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

CALIBRATED BY Christopher Riddle

Q.A. APPROVAL Andres Galeano

END OF REPORT





MICRO PRECISION CALIBRATION, INC.  
 22835 INDUSTRIAL PLACE  
 GRASS VALLEY CA 95949  
 530-268-1860



# Certificate of Calibration

Cert No. 551220085655084

Date: Feb 3, 2023

**Customer:**

STOVE BUILDERS INTERNATIONAL INC.  
 PORTES 11-12  
 250 DE COPENHAGUE  
 SAINT-AUGUSTIN-DE-DESMAURES QC G3A 2H3

Work Order #: SAC-70126947  
 Purchase Order #: 76863  
 Serial Number: 79977  
 Department: N/A  
 Performed By: RICHARD BURGESS  
 Received Condition: IN TOLERANCE  
 Returned Condition: IN TOLERANCE  
 Cal. Date: February 03, 2023  
 Cal. Interval: 12 MONTHS  
 Cal. Due Date: February 03, 2024

MPC Control #: DA5991  
 Asset ID: SBI-097  
 Gage Type: THERMO-ANEMOMETER  
 Manufacturer: EUROTRON  
 Model Number: VT 50  
 Size: N/A  
 Temp/RH: 21.0°C / 45.0%  
 Location: Calibration performed at MPC facility

**Calibration Notes:**

See attached calibration data. (1 page/s)

**Standards Used to Calibrate Equipment**

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
CR6800	HUMIDITY GENERATOR/ENVIRONMENTAL CHAMBER	2500	0012263	THUNDER SCIENTIFIC CORPORATION	Feb 28, 2023	551220084791099
DA8367	PRECISION PLATINUM RESISTANCE THERMOMETER SPRT W/ CASE	8167-25	180322	LEEDS & NORTHRUP CO.	Mar 31, 2023	551220085379565
CS0080	ANEMOMETER	HHF141A	1017400	OMEGA	Sep 30, 2023	800413329
CJ5100	WIND TUNNEL WITH CONTROLLER	JS-500	375/305	INTERACTIVE INSTRUMENTS	Nov 30, 2023	551220084628339

Calibrating Technician:

RICHARD BURGESS

QC Approval:

MARVIN ILAO

STATEMENTS OF PASS OR FAIL CONFORMANCE: The uncertainty of measurement has been taken into account when determining compliance with specification. All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCSL 2540.3-2006.

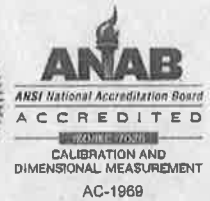
**THE CALIBRATION REPORT STATUS:**

PASS - Term used when compliance statement is given, and the measurement result is PASS.  
 PASS\* - Term used when compliance statement is given, and the measurement result is conditional passed or PASS\*.  
 FAIL - Term used when compliance statement is given, and the measurement result is FAIL.  
 FAIL\* - Term used when compliance statement is given, and the measurement result is conditional failed or FAIL\*.  
 REPORT OF VALUE - Term used when reported measurement is not requiring compliance statement in report.  
 ADJUSTED - When adjustments are made to an instrument which changes the value of measurement from what was measured as found to new value as left.  
 LIMITED - When an instrument fails calibration but is still functional in a limited manner.

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated. This calibration report complies with ISO/IEC 17025:2017, ANSI/NCSL 2540.3-2006 and ANSI/NCSL 2540.1-1994. Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. The information on this report pertains only to the instrument identified, this may not be reproduced in part or in a whole without the prior written approval of the issuing MPC Calibration Laboratory.



MICRO PRECISION CALIBRATION, INC.  
 22835 INDUSTRIAL PLACE  
 GRASS VALLEY CA 95949  
 530-268-1880



# Certificate of Calibration

Date: Feb 3, 2023

Cert No. 551220085655084

## Procedures Used in this Event

Procedure Name	Description
MPC-AIR-001 Rev. 02	Air Velocity, Temperature and Flow Meters, General, rev02, Jun-28-2021
MPC-TEM-001 Rev. 04	Temperature Sensors and Indicators, General, rev.04, Jul-07-2021

Calibrating Technician:

RICHARD BURGESS

QC Approval:

MARVIN ILAO

**STATEMENTS OF PASS OR FAIL CONFORMANCE:** The uncertainty of measurement has been taken into account when determining compliance with specification. All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCCL 2540.3-2006.

**THE CALIBRATION REPORT STATUS:**

**PASS** - Term used when compliance statement is given, and the measurement result is PASS.  
**PASS\*** - Term used when compliance statement is given, and the measurement result is conditional passed or PASS\*.  
**FAIL** - Term used when compliance statement is given, and the measurement result is FAIL.  
**FAIL\*** - Term used when compliance statement is given, and the measurement result is conditional failed or FAIL\*.  
**REPORT OF VALUE** - Term used when reported measurement is not requiring compliance statement in report.  
**ADJUSTED** - When adjustments are made to an instrument which changes the value of measurement from what was measured as found to new value as left.  
**LIMITED** - When an instrument fails calibration but is still functional in a limited manner.

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated. This calibration report complies with ISO/IEC 17025:2017, ANSI/NCCL 2540.3-2006 and ANSI/NCCL 2540.1-1994. Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. The information on this report pertains only to the instrument identified; this may not be reproduced in part or in a whole without the prior written approval of the issuing MP Calibration Laboratory.





## Calibration Report of Eurotron VT 50 Thermo-Anemometer

MPC Control #: <u>DA5991</u>	Serial Number: <u>79977</u>
Asset ID: <u>SBI-097</u>	Calibration Date: <u>February 03, 2023</u>

### Hotwire Air Velocity Accuracy

Function Tested	Nominal	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)	TUR
Velocity, FPM	1500 FPM	1416 FPM	1511 FPM	1511 FPM	1584 FPM	PASS	21 FPM	≥ 4.0 : 1
	3000 FPM	2871 FPM	3017 FPM	3017 FPM	3129 FPM	PASS	37 FPM	3.5 : 1
	4500 FPM	4326 FPM	4509 FPM	4509 FPM	4674 FPM	PASS	54 FPM	3.2 : 1
	5700 FPM	5490 FPM	5711 FPM	5711 FPM	5910 FPM	PASS	68 FPM	3.1 : 1

### Temperature Accuracy

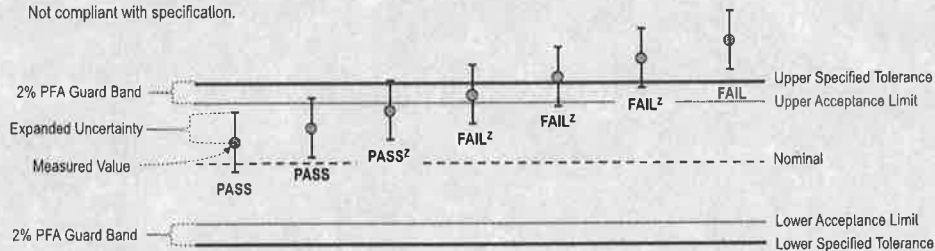
Function Tested	Nominal	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)	TUR
Temperature, °F	45.0 °F	43.56 °F	44.9 °F	44.9 °F	46.44 °F	PASS	0.12 °F	≥ 4.0 : 1
	90.0 °F	87.66 °F	89.8 °F	89.8 °F	92.34 °F	PASS	0.12 °F	≥ 4.0 : 1
	135.0 °F	131.76 °F	134.6 °F	134.6 °F	138.24 °F	PASS	0.12 °F	≥ 4.0 : 1
	171.0 °F	167.04 °F	170.1 °F	170.1 °F	174.96 °F	PASS	0.12 °F	≥ 4.0 : 1

### Statements of Pass or Fail Conformance

The uncertainty of measurement has been taken into account when determining compliance with specification.  
 All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCSL Z540.3-2006

The status of compliance with the acceptance criteria is reported as:

- PASS** — Compliant with specification.
- PASS<sup>2</sup>** — The measured value is within acceptance limits.  
However, a portion of the expanded uncertainty of measurement at 95% exceeds the specified tolerance.
- FAIL<sup>2</sup>** — The measured value is not within the acceptance limits.  
However, a portion of the expanded uncertainty of measurement at 95% is within the specified tolerance.
- FAIL** — Not compliant with specification.



**Acceptance limits for ≤ 2% probability of false accept (PFA) guard band**

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated.

This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCSL Z540.3-2006, Method 6 --- Guard Bands Based on Test Uncertainty Ratio.

- End of Calibration Report -

## CALIBRATION CERTIFICATE # 19025

Calibration date : 2023-03-14

Certificate issued : 2023-03-14

**Stove Builder International**  
250, rue de Copenhague  
Saint-Augustin-de-Desmaures, Québec, Canada  
G3A 2H3

Calibration of  
**Positive displacement flow meter American Meter Company DTM-200A S/N : 98Z332226**

### QUALITY PROGRAM CONFORMANCE

All calibrations are performed in accordance with Polycontrols Laboratory Quality Assurance Manual and conform to ISO/IEC 17025: 2017, ISO 9001 – 2015 and/or other quality requirements defined in customers purchase descriptions. The results are strictly valid for the device under test or calibration. If applicable, the decision rule is described in the certificate.

### TRACEABILITY

The traceability for flow standard to the National Institute of Standards and Technology, NIST, is maintained by Fluke Corporation of Phoenix, Arizona and conform to ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO-10012-1 and MIL-STD 45662A.

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither CLAS nor SCC guarantee the accuracy of individual calibrations by accredited laboratories.

### CALIBRATION OF MEASURING AND TEST EQUIPMENT

For calibration measurement capability, please refer to the Canadian Calibration Network web page at the National Research Council of Canada. This laboratory is accredited by the Standards Council of Canada as part of the Calibration Laboratory Assessment Service (CLAS) program and is listed at [nrc.canada.ca](http://nrc.canada.ca).

This document forms part of the Certificate of Accreditation issued by the Standards Council of Canada (SCC). The original version is available in the Directory of Accredited Laboratories on the SCC website at [www.scc.ca](http://www.scc.ca).

### CONDITION SUMMARY OF THE DEVICE UNDER TEST

Initial conditions	In good condition
Work done	Calibration of the instrument Initial readings = Final readings, no adjustment
Results	Final readings in tolerance
Remarks	Calibration frequency every 6 months

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Bernard Poirier  
Metrologist

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Laboratory Manager

## Calibration certificate # 19025

Serial Number:	98Z332226	Test stand:	3
Calibration Date:	2023-03-14	Procedure:	POS-CAL-005
Instrument ID:	SBI-047	Decision rule:	Method #3

### Standard equipment used for final calibration

Description	Model	Serial #	Traceability	Due date
Fluke molbloc_5 slpm	5E3-VCR-V-Q	2473	1500332258	2023-05-18
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2359	1500349861	2024-03-02
Fluke molbox1+	Molbox1+	2089	1500349737	2024-02-28
RTD Mist	Mist	L00295	2022009672	2024-01-03
Module 44.5 PSI avec Baro 163671	Module 30	160659	2022003929	2023-05-13

### Final specifications of the device under test

### Calibration conditions

Gas	Air	Gas	Air
Operation temperature	20 °C	Ambient temperature	22 °C
Inlet pressure		Ambient pressure	1009 mbar
Outlet pressure		Orientation	
Reference temperature		Seals	
Reference pressure		Valve	
Range	0-200 ACFH		
Input/Output Signals	-		
Supply			
Accuracy	±2 % O.R.		

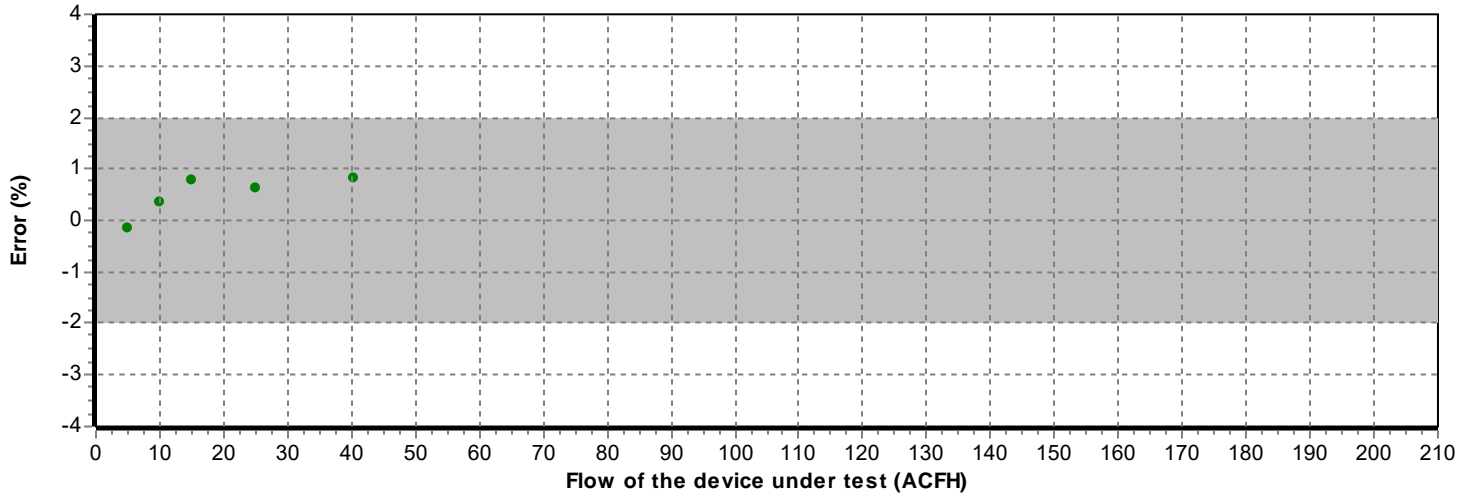
### Final readings

Test Flow ACFH	Device under test ft <sup>3</sup>	Measured values			Calculated Reference ft <sup>3</sup>	Calculated Error ft <sup>3</sup>	Acceptable Error ft <sup>3</sup>	Uncertainty k = 2 ft <sup>3</sup>	TUR
		Pressure PSIA	Temperature °C	Reference ft <sup>3</sup>					
5.0782	0.8440	14.639	22.41	0.8383	0.8453	-0.0013	0.0169	0.0022	>4
10.0647	1.6810	14.636	22.37	1.6611	1.6750	0.0060	0.0335	0.0056	>4
15.1360	2.5390	14.634	22.33	2.4984	2.5194	0.0196	0.0504	0.0084	>4
25.1854	4.2180	14.633	22.27	4.1579	4.1923	0.0257	0.0838	0.0139	>4
40.2501	6.7450	14.633	22.23	6.6358	6.6898	0.0552	0.1338	0.0222	>4

**Calibration certificate # 19025**

Serial Number:	98Z332226	Test stand:	3
Calibration Date:	2023-03-14	Procedure:	POS-CAL-005
Instrument ID:	SBI-047	Decision rule:	Method #3

**Final results**



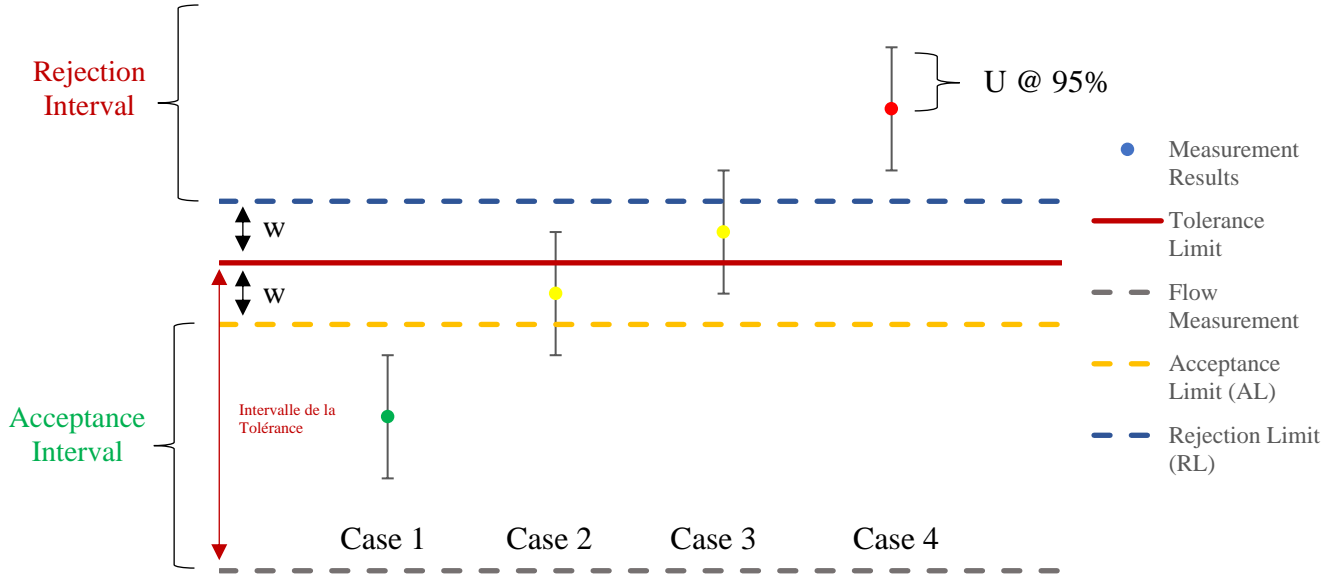
See the appendix for the guideline of decision rule

*Appendix for the decision rule*

**Method #3 Non-binary Statement with Guard Band, uncertainty directly taken into account**

This decision rule uses a guard band to define the acceptance and rejection interval. The acceptance limit is defined by the following mathematical formula  $AL = TL - w$  and the rejection limit  $RL = TL + w$ , where  $w = rU$ . The multiple  $r$  that is multiplied by the expanded measurement uncertainty  $U$  can be defined following ILAC G8: 2019 table 1 section 5.2. The expanded measurement uncertainty  $U$  has a 95% coverage probability ( $k = 2$ ). Non-binary statement with guard band exists when the result is limited to four choices: pass, conditional pass, conditional fail, and fail.

Statements of conformity are reported as:



*Graphical representation of a Non-Binary Statement with a Guard Band*

**Case 1 – Below acceptance limit AL**

**Status: In tolerance**

- The result is inside the acceptance interval. However, assuming a normal distribution, the risk that the result is outside the tolerance limit could be up to 2.5%. Uncertainty is directly taken into account. **Green**.

**Case 2 – Below tolerance limit TL, greater than acceptance limit AL**

**Status: In tolerance-Conditional**

- The result is outside the acceptance interval but below tolerance limit. However, the observed value is inside the guard band  $w = TL - AL$  and the status is conditional on the customer’s risk assessment. Uncertainty is directly taken into account. **Yellow**.

**Case 3 – Greater than tolerance limit, below rejection limit RL**

**Status: Out of tolerance-Conditional**

- Le result is greater than tolerance limit but outside the rejection interval. However, the observed value is inside the guard band  $w = TL - RL$  and the status is conditional on the customer’s risk assessment. Uncertainty is directly taken into account. **Yellow**.

**Case 4 – Greater than rejection limit RL**

**Status: Out of tolerance**

- The result is inside the rejection interval. Uncertainty is directly taken into account. **Red**.

**CALIBRATION CERTIFICATE # 19648**

Calibration date : 2023-05-25  
Certificate issued : 2023-05-25

**Stove Builder International**  
250, rue de Copenhague  
Saint-Augustin-de-Desmaures, Québec, Canada  
G3A 2H3

**Calibration of**  
**Positive displacement flow meter American Meter Company DTM-200A S/N : 90R054300**

**QUALITY PROGRAM CONFORMANCE**

All calibrations are performed in accordance with Polycontrols Laboratory Quality Assurance Manual and conform to ISO/IEC 17025: 2017, ISO 9001 – 2015 and/or other quality requirements defined in customers purchase descriptions. The results are strictly valid for the device under test or calibration. If applicable, the decision rule is described in the certificate.

**TRACEABILITY**

The traceability for flow standard to the National Institute of Standards and Technology, NIST, is maintained by Fluke Corporation of Phoenix, Arizona and conform to ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO-10012-1 and MIL-STD 45662A.

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither CLAS nor SCC guarantee the accuracy of individual calibrations by accredited laboratories.

**CALIBRATION OF MEASURING AND TEST EQUIPMENT**

For calibration measurement capability, please refer to the Canadian Calibration Network web page at the National Research Council of Canada. This laboratory is accredited by the Standards Council of Canada as part of the Calibration Laboratory Assessment Service (CLAS) program and is listed at [nrc.canada.ca](http://nrc.canada.ca).

This document forms part of the Certificate of Accreditation issued by the Standards Council of Canada (SCC). The original version is available in the Directory of Accredited Laboratories on the SCC website at [www.scc.ca](http://www.scc.ca).

**CONDITION SUMMARY OF THE DEVICE UNDER TEST**

Initial conditions	In good condition
Work done	Calibration of the instrument Initial readings = Final readings, no adjustment
Results	Final readings in tolerance
Remarks	Calibration frequency every 6 months

---

Bernard Poirier  
Metrologist

---

Laboratory Manager

## Calibration certificate # 19648

Serial Number:	90R054300	Test stand:	3
Calibration Date:	2023-05-25	Procedure:	POS-CAL-005
Instrument ID:	SBI-046	Decision rule:	Method #3

### Standard equipment used for final calibration

Description	Model	Serial #	Traceability	Due date
Fluke molbloc_5 slpm	5E3-VCR-V-Q	8049	1500349804	2024-03-01
Fluke molbloc_120 slpm	2E2-S	237	1500349857	2024-03-02
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2359	1500349861	2024-03-02
Fluke molbox 1+	Molbox 1+	755+	1500336282	2023-07-21
RTD Mist	M22	3061002	2022005164	2023-06-27
Module 44.5 PSI avec Baro 163671	Module 30	160659	2023003753	2024-05-18

### Final specifications of the device under test

### Calibration conditions

Gas	Air	Gas	Air
Operation temperature	20 °C	Ambient temperature	23 °C
Inlet pressure		Ambient pressure	1012.94 mbar
Outlet pressure		Orientation	Horizontal
Reference temperature		Seals	
Reference pressure		Valve	
Range	0-200 ACFH		
Input/Output Signals	-		
Supply			
Accuracy	±2 %F.S.		

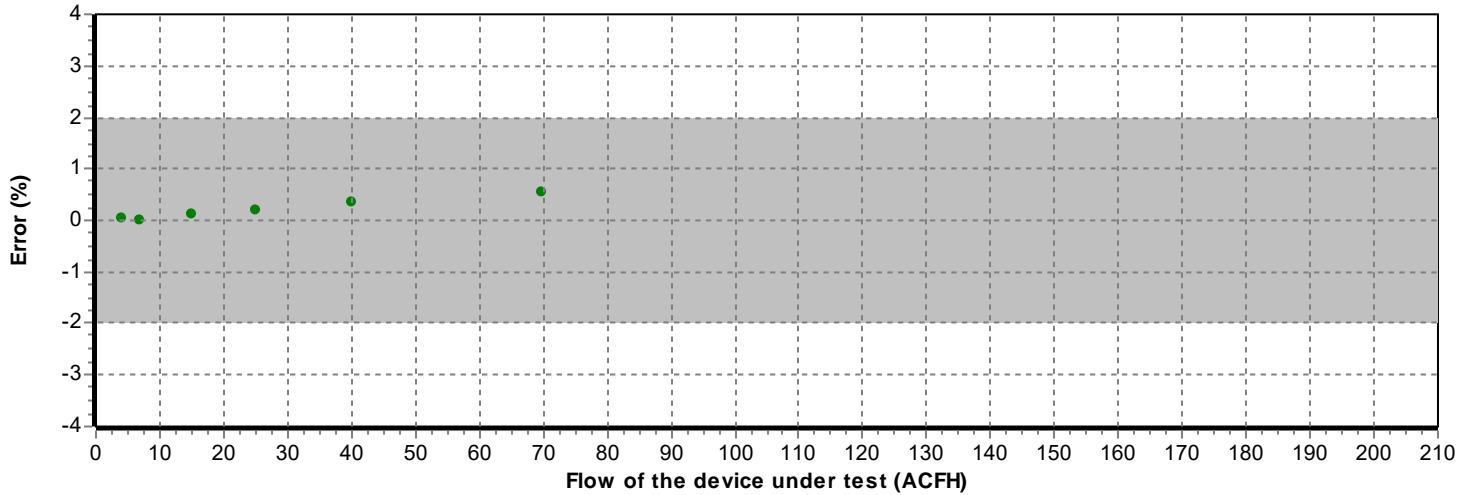
### Final readings

Test Flow ACFH	Device under test ft <sup>3</sup>	Measured values			Calculated Reference ft <sup>3</sup>	Calculated Error ft <sup>3</sup>	Acceptable Error ft <sup>3</sup>	Uncertainty k = 2 ft <sup>3</sup>	TUR
		Pressure PSIA	Temperature °C	Reference ft <sup>3</sup>					
4.0564	1.0230	14.723	22.36	1.0107	1.0132	0.0098	0.9991	0.0026	>4
7.0120	1.1730	14.725	22.45	1.1650	1.1680	0.0050	0.6663	0.0029	>4
14.9765	2.5380	14.722	22.32	2.4874	2.4933	0.0447	0.6659	0.0083	>4
24.9220	4.2180	14.722	22.38	4.1448	4.1555	0.0625	0.6670	0.0138	>4
40.0722	6.7850	14.724	22.29	6.6571	6.6710	0.1140	0.6659	0.0222	>4
69.7237	11.7790	14.733	22.30	11.5856	11.6031	0.1759	0.6657	0.0285	>4

## Calibration certificate # 19648

Serial Number:	90R054300	Test stand:	3
Calibration Date:	2023-05-25	Procedure:	POS-CAL-005
Instrument ID:	SBI-046	Decision rule:	Method #3

### Final results



See the appendix for the guideline of decision rule

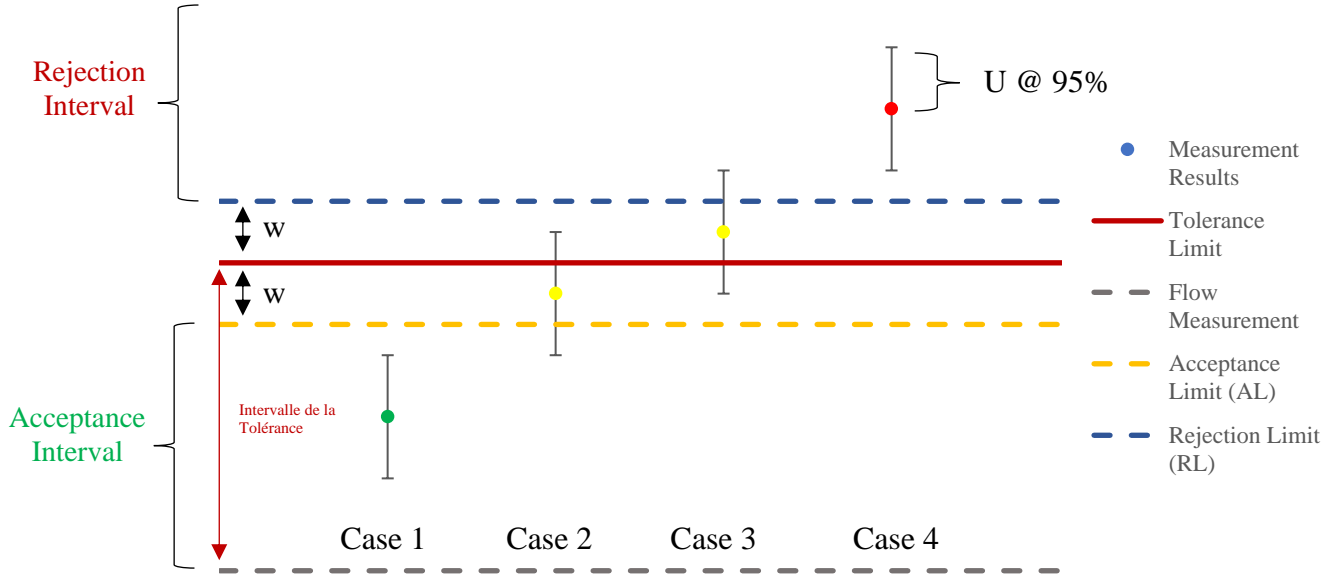


*Appendix for the decision rule*

**Method #3 Non-binary Statement with Guard Band, uncertainty directly taken into account**

This decision rule uses a guard band to define the acceptance and rejection interval. The acceptance limit is defined by the following mathematical formula  $AL = TL - w$  and the rejection limit  $RL = TL + w$ , where  $w = rU$ . The multiple  $r$  that is multiplied by the expanded measurement uncertainty  $U$  can be defined following ILAC G8: 2019 table 1 section 5.2. The expanded measurement uncertainty  $U$  has a 95% coverage probability ( $k = 2$ ). Non-binary statement with guard band exists when the result is limited to four choices: pass, conditional pass, conditional fail, and fail.

Statements of conformity are reported as:



*Graphical representation of a Non-Binary Statement with a Guard Band*

**Case 1 – Below acceptance limit AL**

**Status: In tolerance**

- The result is inside the acceptance interval. However, assuming a normal distribution, the risk that the result is outside the tolerance limit could be up to 2.5%. Uncertainty is directly taken into account. **Green**.

**Case 2 – Below tolerance limit TL, greater than acceptance limit AL**

**Status: In tolerance-Conditional**

- The result is outside the acceptance interval but below tolerance limit. However, the observed value is inside the guard band  $w = TL - AL$  and the status is conditional on the customer’s risk assessment. Uncertainty is directly taken into account. **Yellow**.

**Case 3 – Greater than tolerance limit, below rejection limit RL**

**Status: Out of tolerance-Conditional**

- The result is greater than tolerance limit but outside the rejection interval. However, the observed value is inside the guard band  $w = TL - RL$  and the status is conditional on the customer’s risk assessment. Uncertainty is directly taken into account. **Yellow**.

**Case 4 – Greater than rejection limit RL**

**Status: Out of tolerance**

- The result is inside the rejection interval. Uncertainty is directly taken into account. **Red**.

Mettler-Toledo Inc.  
Service Division  
1900 Polaris Parkway  
Columbus, OH 43240  
1-800-METTLER



Accrédité par le "American Association  
for Laboratory Accreditation (A2LA)"

CERTIFICAT D'ÉTALONNAGE #1902.01

ISO 17025 Registered  
ANSI/NCSL Z540-1 Accredited

## Certificat d'étalonnage ACC

Accuracy Calibration Certificate

### Client

**Société:** SBI Fabricant De Poeles  
**Adresse:** 250 rue de Copenhague  
**Ville:** Saint-Augustin-de-Desmaures **Contact:** André Bouchard  
**Code Postal:** G3A 2H3  
**Région:** Quebec

### Appareil de pesage

**Constructeur:** Avery Weigh-Tronix **Type d'instrument:** Instrument de pesage  
**Modèle:** DSL-4848 **N° inventaire:** SBI-014 FLOOR SCALE  
**N° de série:** B00927386KL **Modèle Terminal:** N/A  
**Bâtiment:** N/A **N° de série Terminal:** N/A  
**Étage:** N/A **N° inventaire Terminal:** N/A  
**Pièce:** N/A

Étendue	Portée Max.	Résolution (d)
1	500 kg	0.02 kg

### Procédure

**Instruction d'étalonnage :** ASTM E898 - 20  
**Instruction de travail :** 30260953

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

Ce certificat d'étalonnage contient des mesures pour les étalonnages Avant et Après réglage.

La sensibilité/pente de l'instrument a été ajustée avant l'étalonnage Après réglage avec un poids externe.

Il a été convenu avec l'utilisateur d'étalonner en dessous de la portée maximale de la balance.

	Température		Humidité	
Avant réglage	Début: 19.8 °C	Fin: 19.8 °C	Début: 31.0 %	Fin: 31.0 %
Après réglage	Début: 19.9 °C	Fin: 19.9 °C	Début: 31.0 %	Fin: 31.0 %

Les conditions ambiantes ont été vérifiées pour s'assurer de l'exactitude de l'étalonnage.

Ce certificat est délivré conformément aux conditions d'accréditation accordées par l'A2LA, sur la base de la norme ISO/IEC 17025. L'A2LA a évalué la capacité de mesure du laboratoire et sa traçabilité aux étalons nationaux reconnus.

**Date étal. Avant réglage :** 16-03-2023  
**Date étal. Après réglage :** 16-03-2023  
**Date d'édition :** 16-03-2023

**Signataire autorisé A2LA :**

Dany Careau

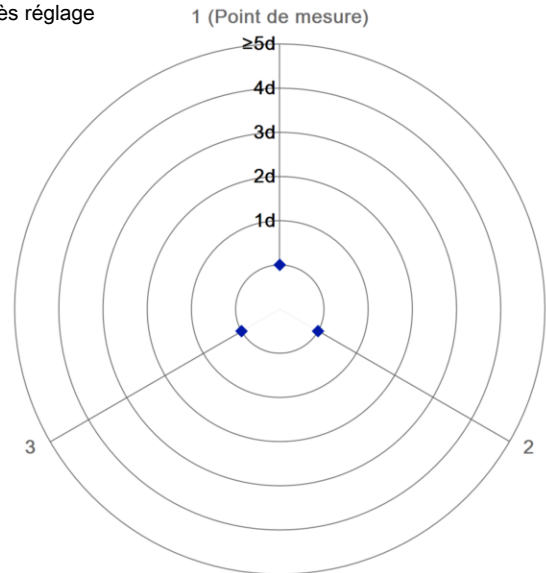
## Résultats de mesure

### Répétabilité

Charge d'essai: 100 kg

	Avant réglage	Après réglage
1	N/A	100.00 kg
2	N/A	100.00 kg
3	N/A	100.00 kg
<b>Écart-type</b>	<b>N/A</b>	<b>0.000 kg</b>

○ Avant réglage  
◆ Après réglage



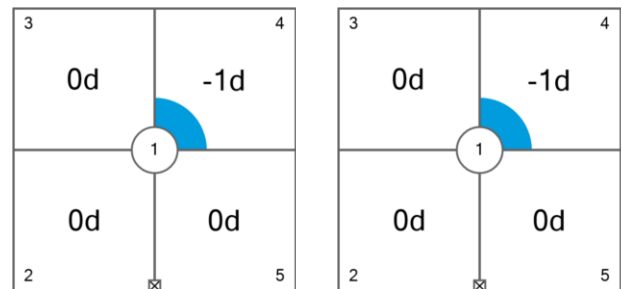
Le "d" dans le graphique représente la résolution de l'étendue/échelon dans lequel l'essai a été effectué.

Les résultats de ce graphique sont basés sur les valeurs absolues des différences par rapport à la valeur moyenne.

### Excentration

Charge d'essai: 100 kg

Position	Avant réglage	Après réglage
1	100.02 kg	100.00 kg
2	100.02 kg	100.00 kg
3	100.02 kg	100.00 kg
4	100.00 kg	99.98 kg
5	100.02 kg	100.00 kg
<b>Écart maximal</b>	<b>0.02 kg</b>	<b>0.02 kg</b>



Avant réglage

Après réglage

Le "d" dans le graphique représente la résolution de l'étendue/échelon dans lequel l'essai a été effectué.

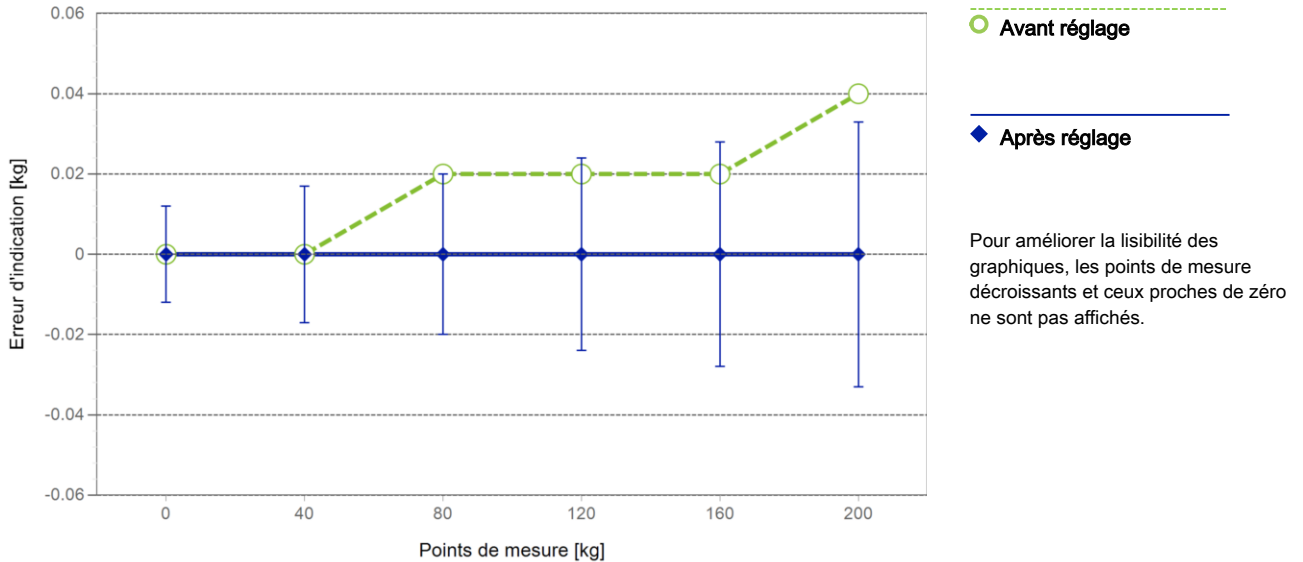
### Erreur d'indication

Avant réglage

	Valeur Référence	Indication	Erreur d'indication	Incertitude élargie	k
1	0 kg	0.00 kg	0.00 kg	N/A	N/A
2	40 kg	40.00 kg	0.00 kg	N/A	N/A
3	80 kg	80.02 kg	0.02 kg	N/A	N/A
4	120 kg	120.02 kg	0.02 kg	N/A	N/A
5	160 kg	160.02 kg	0.02 kg	N/A	N/A
6	200 kg	200.04 kg	0.04 kg	N/A	N/A

**Après réglage**

	Valeur Référence	Indication	Erreur d'indication	Incertitude élargie	k
1	0 kg	0.00 kg	0.00 kg	0.012 kg	2
2	40 kg	40.00 kg	0.00 kg	0.017 kg	2
3	80 kg	80.00 kg	0.00 kg	0.020 kg	2
4	120 kg	120.00 kg	0.00 kg	0.024 kg	2
5	160 kg	160.00 kg	0.00 kg	0.028 kg	2
6	200 kg	200.00 kg	0.00 kg	0.033 kg	2



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

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

**Équipement d'essai**

Tous les poids utilisés pour le contrôle métrologique sont raccordés aux étalons nationaux et internationaux. Les poids sont étalonnés par un laboratoire accrédité.

**Série de Poids 1: OIML M1**

N° série de poids : Q1 Date d'édition : 04-01-2023  
 N° Certificat : 1415726-1415728 Date proch. étalonnage : 04-01-2024

**Remarques**

N/A

**Fin de la partie Étalonnage**

L'information ci-après et les annexes à ce certificat d'étalonnage ne font pas partie du domaine d'accréditation.

## Incertitude de mesure de l'instrument de pesage en utilisation

Établie à partir de l'incertitude élargie en utilisation avec  $k = 2$ . La formule sera utilisée pour estimer l'incertitude en prenant en compte les erreurs d'indication. La valeur R représente l'indication de la charge nette selon l'unité de mesure de l'appareil.

Coefficient de température pour l'évaluation de l'incertitude en utilisation :  $10.0 \cdot 10^{-6} / K$

Étendue de température sur site pour l'évaluation de l'incertitude en utilisation : 10 K

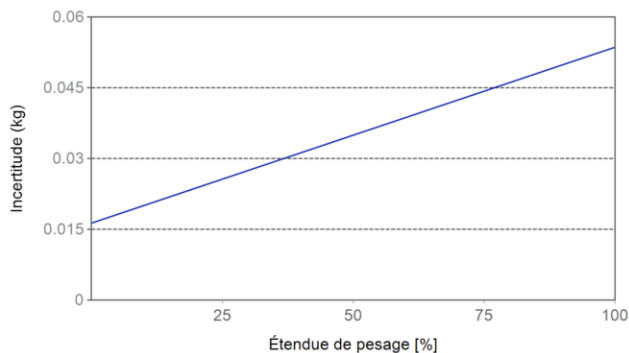
### Linéarisation de l'équation d'incertitude

Étendue			Avant réglage	Après réglage
	d	Max		
1	0.02 kg	200 kg	N/A	$U_1 = 16 \text{ g} + 0.186 \text{ g/kg} \cdot R$

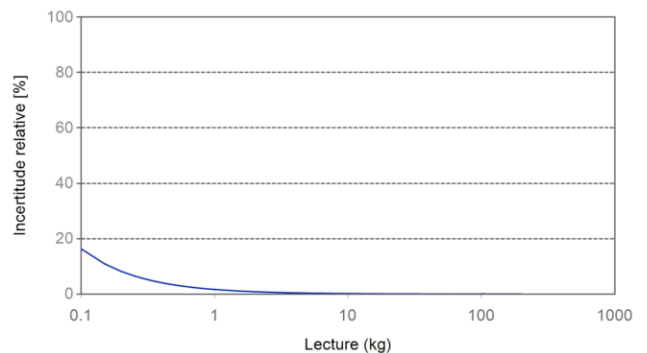
Pour optimiser la stabilité de la linéarisation, en plus du zéro, les points de mesure croissants avec une charge supérieure à 5% de la plage de mesure ou plus sont retenus pour calculer l'équation linéaire.

### Incertitude de mesure absolue et relative en utilisation pour diverses indications nettes (exemples)

Indication Nette	Avant réglage		Après réglage	
0.20 kg	N/A	N/A	0.016 kg	8.0%
2.00 kg	N/A	N/A	0.016 kg	0.82%
20.00 kg	N/A	N/A	0.020 kg	0.099%
100.00 kg	N/A	N/A	0.035 kg	0.035%
200.00 kg	N/A	N/A	0.053 kg	0.027%



Avant réglage



Après réglage

# Évaluation selon les tolérances du HB 44 (Maintenance)

Évaluation effectuée sans tenir compte de l'incertitude de mesure

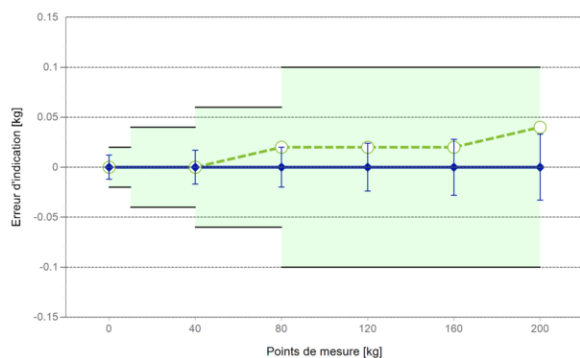
Les mesures du certificat d'étalonnage joint ont été évaluées selon les tolérances définies dans le HB44 du NIST. L'étendue des mesures pour les essais de répétabilité et d'excentration (si réalisé) est comparée aux tolérances de maintenance.

**Avant réglage**      **Après réglage**

**Global**                   = Réussi  
 = Échec

## Appareil de pesage

Étendue	Portée Max.	Résolution (d)	Échelon de vérification (e)	Classe
1	500 kg	0.02 kg	0.02 kg	III



Tolérances définies dans le HB 44 du NIST







Charge d'essai		Tolérance
De	jusqu'à	
0.00 kg	0.00 kg	0.005 kg
0.02 kg	10.00 kg	0.02 kg
10.02 kg	40.00 kg	0.04 kg
40.02 kg	80.00 kg	0.06 kg
80.02 kg	200.00 kg	0.1 kg

 Avant réglage

 Après réglage

— Tolérance













## Excentration et Répétabilité

Essai	Charge d'essai	Tolérance	Avant réglage		Après réglage	
			Erreur max. / Étendue	Résultat	Erreur max. / Étendue	Résultat
Excentration (Erreur max.)	100 kg	0.10 kg	0.02 kg		0.02 kg	
Excentration (Étendue)	100 kg	0.1 kg	0.02 kg		0.02 kg	
Répétabilité (Erreur max.)	100 kg	0.1 kg	N/A	N/A	0.00 kg	
Répétabilité (Étendue)	100 kg	0.10 kg	N/A	N/A	0.00 kg	

**Erreur max.:** Maximum des valeurs absolues of erreurs individuelles.

**Étendue:** Différence entre la plus grande et la plus valeur de mesure.

## Erreur d'indication

	Valeur référence	Tolérance	Avant réglage		Après réglage	
			Erreur d'indication	Résultat	Erreur d'indication	Résultat
1	0 kg	0.02 kg	0.00 kg		0.00 kg	
2	40 kg	0.04 kg	0.00 kg		0.00 kg	
3	80 kg	0.06 kg	0.02 kg		0.00 kg	
4	120 kg	0.10 kg	0.02 kg		0.00 kg	
5	160 kg	0.10 kg	0.02 kg		0.00 kg	
6	200 kg	0.10 kg	0.04 kg		0.00 kg	



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

SBI-401

Cert. No.: 4199-13949373

Traceable® Certificate of Calibration for Dial Barometer

Manufactured for and distributed by : Traceable® Products 12554 Galveston Rd B230, Webster, TX 77598

Instrument Identification:

Model: 4199,99760-50 S/N: 230114007 Manufacturer: Control Company

Standards/Equipment:

Table with 4 columns: Description, Serial Number, Due Date, NIST Traceable Reference. Row 1: Digital Barometer, D4540001, 05 Dec 2023, 1000486629

Certificate Information:

Technician: 57 Procedure: CAL-33 Cal Date: 17 Feb 2023 Cal Due Date: 17 Feb 2025
Test Conditions: 24.35%RH 23.52°C 1028mBar

Calibration Data: (New Instrument)

Table with 10 columns: Unit(s), Nominal, As Found, In Tol, Nominal, As Left, In Tol, Min, Max, ±U, TUR. Rows for mb/hPa at 960, 985, and 1028.

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, Quality Manager

Jenny Ren, Technical Manager

Note :

Maintaining Accuracy:

In our opinion once calibrated your Dial Barometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Dial 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.

Issue Date : 17 Feb 2023

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

Control Company is an ISO/IEC 17025:2017 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2015 Quality Certified by DNV GL, Certificate No. CERT-01805-2006-AQ-HOU-ANAB.
International Laboratory Accreditation Cooperation - Multilateral Recognition Arrangement (ILAC-MRA).



# CERTIFICATE OF CALIBRATION



Certificate Number: 2023004264

Page 1 of 2

<b>Manufacturer:</b>	TPI	<b>RMA:</b>	AC23051650
<b>Model:</b>	TPI597	<b>Workorder:</b>	2023004264
<b>Description:</b>	Digital Hygrometer	<b>Barcode:</b>	AL00043687-P
<b>Serial:</b>	20244870042	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	SBI-400	<b>Calibration Date:</b>	29-May-2023
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	29-May-2024
		<b>Temperature:</b>	24.52°C
		<b>Humidity:</b>	30.3%RH

**STATEMENT OF UNCERTAINTY:** The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor  $K = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCCL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

Functional tests are not covered by our scope of accreditation.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Humidity Generator	Thunder Scientific 2500ST	TRH-SRC-01	23-Sep-2022	30-Sep-2023

**Notes:** None

Performed by:

Anthony Morra

Technician

(digitally signed on 29-May-2023 10:46 am)

QA Reviewed by:

Slava Peciurov

Lab Manager

(digitally signed on 29-May-2023 11:38 am)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001



Procedure: T/RH Instruments: CAL VER /2500 (2.5.A)

FOUND-LEFT (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
TEMPERATURE TEST							
23.00 °C	23.18 °C	23.0 °C	±0.615 °C	22.6 °C	23.8 °C	Pass	9.1e-002 °C
HUMIDITY TEST @ 23C							
30.00 %RH	30.00 %RH	32.9 %RH	±3.00 %RH	27.0 %RH	33.0 %RH	Pass	4.5e-001 %RH
50.00 %RH	50.00 %RH	52.0 %RH	±3.00 %RH	47.0 %RH	53.0 %RH	Pass	5.0e-001 %RH
80.00 %RH	80.00 %RH	79.8 %RH	±3.00 %RH	77.0 %RH	83.0 %RH	Pass	5.7e-001 %RH

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2022008680

Page 1 of 2

<b>Manufacturer:</b>	Wika	<b>RMA:</b>	AC22101938
<b>Model:</b>	0 to -30 inHg	<b>Workorder:</b>	2022008680
<b>Description:</b>	Vacuum Gauge	<b>Barcode:</b>	AL00041704-P
<b>Serial:</b>	N/A	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	22101938-02 SBI-391	<b>Calibration Date:</b>	30-Nov-2022
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	30-Nov-2023
		<b>Temperature:</b>	23°C
		<b>Humidity:</b>	37.4%RH

**STATEMENT OF UNCERTAINTY:** The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor  $K = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	14-Jun-2022	30-Jun-2023
Reference Pressure Monitor	Fluke RPM4	PRE-MTR-04	14-Jun-2022	30-Jun-2023

**Notes:** Calibrated in the vertical position.

Performed by:

Tony Wheaton

Technician

(digitally signed on 30-Nov-2022 10:56 am)

QA Reviewed by:

Slava Peciurov

Lab Manager

(digitally signed on 30-Nov-2022 10:56 am)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

Procedure: Pressure/Vacuum: CAL VER /DHI PPC3 (2.3.A)	FOUND-LEFT (Pass)
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Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
VACUUM TEST							
MEASUREMENT UNITS: inHg							
0.00	0.00	0.0	±0.50	-0.5	0.5	Pass	5.8e-002
-6.93	-6.93	-7.0	±0.50	-7.4	-6.4	Pass	5.8e-002
-13.96	-13.96	-14.0	±0.50	-14.5	-13.5	Pass	5.8e-002
-21.08	-21.08	-21.0	±0.50	-21.6	-20.6	Pass	5.8e-002
-28.11	-28.11	-28.0	±0.50	-28.6	-27.6	Pass	5.8e-002
-20.96	-20.96	-21.0	±0.50	-21.5	-20.5	Pass	5.8e-002
-13.92	-13.92	-14.0	±0.50	-14.4	-13.4	Pass	5.8e-002
-6.85	-6.85	-7.0	±0.50	-7.3	-6.3	Pass	5.8e-002
0.00	0.00	0.0	±0.50	-0.5	0.5	Pass	5.8e-002

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2022008679

Page 1 of 2

<b>Manufacturer:</b>	Wika	<b>RMA:</b>	AC22101938
<b>Model:</b>	0 to 30 inHg	<b>Workorder:</b>	2022008679
<b>Description:</b>	Vacuum Gauge	<b>Barcode:</b>	AL00041705-P
<b>Serial:</b>	N/A	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	22101938-03 SBI-392	<b>Calibration Date:</b>	30-Nov-2022
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	30-Nov-2023
		<b>Temperature:</b>	23.05°C
		<b>Humidity:</b>	35.7%RH

**STATEMENT OF UNCERTAINTY:** The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor  $K = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	14-Jun-2022	30-Jun-2023
Reference Pressure Monitor	Fluke RPM4	PRE-MTR-04	14-Jun-2022	30-Jun-2023

**Notes:** Calibrated in the vertical position.

Performed by:

Tony Wheaton

Technician

(digitally signed on 30-Nov-2022 1:03 pm)

QA Reviewed by:

Slava Peciurov

Lab Manager

(digitally signed on 30-Nov-2022 1:09 pm)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

Procedure: Pressure/Vacuum: CAL VER /DHI PPC3 (2.3.A)	FOUND-LEFT (Pass)
---	-------------------

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
VACUUM TEST							
MEASUREMENT UNITS: inHg							
0.00	0.00	0.0	±0.50	-0.5	0.5	Pass	5.8e-002
-6.90	-6.90	-7.0	±0.50	-7.4	-6.4	Pass	5.8e-002
-13.92	-13.92	-14.0	±0.50	-14.4	-13.4	Pass	5.8e-002
-21.06	-21.06	-21.0	±0.50	-21.6	-20.6	Pass	5.8e-002
-28.00	-28.00	-28.0	±0.50	-28.5	-27.5	Pass	5.8e-002
-20.82	-20.82	-21.0	±0.50	-21.3	-20.3	Pass	5.8e-002
-13.81	-13.81	-14.0	±0.50	-14.3	-13.3	Pass	5.8e-002
-6.80	-6.80	-7.0	±0.50	-7.3	-6.3	Pass	5.8e-002
0.00	0.00	0.0	±0.50	-0.5	0.5	Pass	5.8e-002

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2022008678

Page 1 of 2

<b>Manufacturer:</b>	Wika	<b>RMA:</b>	AC22101938
<b>Model:</b>	0-15 psi	<b>Workorder:</b>	2022008678
<b>Description:</b>	Pressure Gauge	<b>Barcode:</b>	AL00041706-P
<b>Serial:</b>	N/A	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	22101938-04 SBI-389	<b>Calibration Date:</b>	30-Nov-2022
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	30-Nov-2023
		<b>Temperature:</b>	22.93°C
		<b>Humidity:</b>	36.9%RH

**STATEMENT OF UNCERTAINTY:** The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor  $K = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Digital Test Gauge	Crystal Eng. XP2i	PRE-MTR-01	22-Aug-2022	31-Aug-2023

**Notes:** Calibrated in the vertical position.

**Performed by:** Tony Wheaton  
Technician  
(digitally signed on 30-Nov-2022 10:08 am)

**QA Reviewed by:** Slava Peciurov  
Lab Manager  
(digitally signed on 30-Nov-2022 10:53 am)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

Procedure: Pressure/Vacuum: CAL VER /Crystal XP2I (1.6.A)

FOUND-LEFT (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
PRESSURE TEST							
0.00 psi	0.00 psi	0.0 psi	±0.25 psi	-0.2 psi	0.2 psi	Pass	1.2e-001 psi
2.93 psi	2.93 psi	3.0 psi	±0.25 psi	2.7 psi	3.2 psi	Pass	1.2e-001 psi
5.95 psi	5.95 psi	6.0 psi	±0.25 psi	5.7 psi	6.2 psi	Pass	1.2e-001 psi
8.94 psi	8.94 psi	9.0 psi	±0.25 psi	8.7 psi	9.2 psi	Pass	1.2e-001 psi
11.87 psi	11.87 psi	12.0 psi	±0.25 psi	11.6 psi	12.1 psi	Pass	1.2e-001 psi
14.82 psi	14.82 psi	15.0 psi	±0.25 psi	14.6 psi	15.1 psi	Pass	1.2e-001 psi
11.82 psi	11.82 psi	12.0 psi	±0.25 psi	11.6 psi	12.1 psi	Pass	1.2e-001 psi
8.86 psi	8.86 psi	9.0 psi	±0.25 psi	8.6 psi	9.1 psi	Pass	1.2e-001 psi
5.82 psi	5.82 psi	6.0 psi	±0.25 psi	5.6 psi	6.1 psi	Pass	1.2e-001 psi
2.86 psi	2.86 psi	3.0 psi	±0.25 psi	2.6 psi	3.1 psi	Pass	1.2e-001 psi
0.00 psi	0.00 psi	0.0 psi	±0.25 psi	-0.2 psi	0.2 psi	Pass	1.2e-001 psi

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2022008681

Page 1 of 2

<b>Manufacturer:</b>	Wika	<b>RMA:</b>	AC22101938
<b>Model:</b>	0-15 psi	<b>Workorder:</b>	2022008681
<b>Description:</b>	Pressure Gauge	<b>Barcode:</b>	AL00041703-P
<b>Serial:</b>	N/A	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	22101938-01 SBI-390	<b>Calibration Date:</b>	30-Nov-2022
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	30-Nov-2023
		<b>Temperature:</b>	22.82°C
		<b>Humidity:</b>	36.7%RH

**STATEMENT OF UNCERTAINTY:** The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor  $K = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Digital Test Gauge	Crystal Eng. XP2i	PRE-MTR-01	22-Aug-2022	31-Aug-2023

**Notes:** Calibrated in the vertical position.

Performed by:

Tony Wheaton

Technician

(digitally signed on 30-Nov-2022 9:54 am)

QA Reviewed by:

Slava Peciurov

Lab Manager

(digitally signed on 30-Nov-2022 10:55 am)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001



Procedure: Pressure/Vacuum: CAL VER /Crystal XP2I (1.6.A)

FOUND-LEFT (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
PRESSURE TEST							
0.00 psi	0.00 psi	0.0 psi	±0.25 psi	-0.2 psi	0.2 psi	Pass	1.2e-001 psi
2.96 psi	2.96 psi	3.0 psi	±0.25 psi	2.7 psi	3.2 psi	Pass	1.2e-001 psi
5.94 psi	5.94 psi	6.0 psi	±0.25 psi	5.7 psi	6.2 psi	Pass	1.2e-001 psi
8.99 psi	8.99 psi	9.0 psi	±0.25 psi	8.7 psi	9.2 psi	Pass	1.2e-001 psi
11.91 psi	11.91 psi	12.0 psi	±0.25 psi	11.7 psi	12.2 psi	Pass	1.2e-001 psi
14.92 psi	14.92 psi	15.0 psi	±0.25 psi	14.7 psi	15.2 psi	Pass	1.2e-001 psi
11.94 psi	11.94 psi	12.0 psi	±0.25 psi	11.7 psi	12.2 psi	Pass	1.2e-001 psi
8.86 psi	8.86 psi	9.0 psi	±0.25 psi	8.6 psi	9.1 psi	Pass	1.2e-001 psi
5.87 psi	5.87 psi	6.0 psi	±0.25 psi	5.6 psi	6.1 psi	Pass	1.2e-001 psi
2.92 psi	2.92 psi	3.0 psi	±0.25 psi	2.7 psi	3.2 psi	Pass	1.2e-001 psi
0.00 psi	0.00 psi	0.0 psi	±0.25 psi	-0.2 psi	0.2 psi	Pass	1.2e-001 psi

END OF CERTIFICATE

Délivré à :

Fabricant de poêlesinternational Inc (SBI)

Delivered to:

250 rue De Copenhague

St-Augustin-Desmaures, Qc G3A2h3

Certificat d'étalonnage/Calibration certificate

No E23-SBI-375

Tél que trouvé/As Found

**Instrument étalonné/ Instrument calibrated**

<b>Désignation/ designation :</b>	Module d'acquisition	<b>Plage de mesure/ Range :</b>	1400°F
<b>Marque/ Brand :</b>	National Instrument	<b>Résolution/ readability :</b>	0,1°F
<b>Type/ Model :</b>	NI 9213	<b>Type de thermocouple/ Thermocouple Type:</b>	K
<b>SN :</b>	NA	<b>Affectation/ Allocation :</b>	NA
<b>ID#:</b>	SBI-375	<b>EMT utilisateur/ user tolerance :</b>	± 1°F
		<b>Date d'étalonnage/ Calibration date :</b>	25 mai 2023
		<b>Prochain étalonnage/ Due date :</b>	25 novembre 2023

**Conditions d'environnement/ Test Conditions**

Température/Temperature :	72 °F
Humidité/Humidity :	35 %HR
Pression barométrique :	755 mmHg

**Étalons utilisés/ Standards used**

Instrument	Type/ Model	Marque/ Brand	NS/ID#	Date d'étalonnage Calibration date	Prochain étalonnage Due Date
Calibrateur de process	744	FLUKE	9448002	20 juil. 2021	20 juil. 2023
Thermohygromètre	HC2A-S3	ROTRONIC	20590052	7 septembre 2022	7 septembre 2024
Baromètre	FB61291	Traceable	111576751	24 février 2023	24 février 2024

Le Service d'évaluation des laboratoires d'étalonnage (CLAS) du Conseil national de recherches du Canada (CNRC) a évalué et certifié la capacité d'étalonnage du laboratoire measurepro inc et la traçabilité au Système international d'unités (SI) ou à des étalons acceptables selon le CLAS. Le présent certificat d'étalonnage est délivré conformément aux conditions de certification du CLAS et aux conditions d'accréditation du Conseil canadien des normes (CCN). Le CLAS et le CCN ne garantissent pas l'exactitude des étalonnages individuels effectués par les laboratoires accrédités. Les incertitudes élargies sont fonction du facteur de couverture  $k = 2$ , selon un degré de confiance d'environ 95 %, en supposant une répartition normale. Une étiquette measurepro inc mentionnant la date d'étalonnage et celle de la prochaine intervention (à la demande du client) est apposée sur l'appareil à l'issue du présent étalonnage. Le droit d'auteur du présent certificat appartient au laboratoire measurepro inc et doit être reproduit intégralement, à moins d'une autorisation écrite du laboratoire measurepro inc.

Date d'émission du certificat/ Date of issue : 25 mai 2023

Karim Bouyahia

Travaux effectués par/ Performed By

*K. Bouyahia*

Le Directeur du Laboratoire/The Lab manager

Délivré à:  
Delivered to:

**Fabricant de poêlesinternational Inc (SBI)**  
250 rue De Copenhague  
St-Augustin-Desmaures, Qc G3A2h3

Certificat d'étalonnage/Calibration certificate  
No E23-SBI-375

**Résultat de l'étalonnage/ Calibration result**

**Procédure utilisée/ procedure used :** PC 7.2.70\_Étalonnage des thermomètre pas simulation

**Les résultats de l'étalonnage concernent l'instrument décrit à la section «Instrument étalonné»**

**Déclaration de conformité : Selon ILAC G8 - Simple Accéptation (W=0)**

**Justesse-Répétabilité-Incertitude élargie**

Point de consigne	Valeur Étalon	Valeur lue	Écart	Incertitude élargie (K=2)	Tolérance	Conformité
Set point	Standard value	Avant ajustage	deviation	Expanded uncertainty (K=2)		Conformity
[°F]	[°F]	[°F]	[°F]	±[°F]	±[°F]	
70,00	70,0	70,2	0,2	1,0	1	Conforme
200,00	200,0	200,1	0,1	1,0	1	Conforme
600,00	600,0	600,0	0,0	1,0	1	Conforme
1000,00	1000,0	1000,0	0,0	1,0	1	Conforme
1400,00	1400,0	1400,1	0,1	1,0	1	Conforme

**Fin du certificat d'étalonnage**

**CALIBRATION CERTIFICATE # 18721**

**Calibration date : 2023-02-03**

**Certificate issued : 2023-02-03**

**Stove Builder International  
250, rue de Copenhague  
Saint-Augustin-de-Desmaures, Québec, Canada  
G3A 2H3**

**Calibration of  
Volumetric flow meter Sensus S-275 S/N : 25125397**

**QUALITY PROGRAM CONFORMANCE**

All calibrations are performed in accordance with Polycontrols Laboratory Quality Assurance Manual and conform to ISO/IEC 17025: 2017, ISO 9001 – 2015 and/or other quality requirements defined in customers purchase descriptions. The results are strictly valid for the device under test or calibration. If applicable, the decision rule is described in the certificate.

**TRACEABILITY**

The traceability for flow standard to the National Institute of Standards and Technology, NIST, is maintained by Fluke Corporation of Phoenix, Arizona and conform to ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO-10012-1 and MIL-STD 45662A.

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither CLAS nor SCC guarantee the accuracy of individual calibrations by accredited laboratories.

**CALIBRATION OF MEASURING AND TEST EQUIPMENT**

For calibration measurement capability, please refer to the Canadian Calibration Network web page at the National Research Council of Canada. This laboratory is accredited by the Standards Council of Canada as part of the Calibration Laboratory Assessment Service (CLAS) program and is listed at [nrc.canada.ca](http://nrc.canada.ca).

This document forms part of the Certificate of Accreditation issued by the Standards Council of Canada (SCC). The original version is available in the Directory of Accredited Laboratories on the SCC website at [www.scc.ca](http://www.scc.ca).

**CONDITION SUMMARY OF THE DEVICE UNDER TEST**

Initial conditions	In good condition
Work done	Calibration of the instrument Initial readings = Final readings, no adjustment
Results	Final readings in tolerance
Remarks	Calibration frequency every 6 months

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Bernard Poirier  
Metrologist

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Laboratory Manager

## Calibration certificate # 18721

Serial Number:	25125397	Test stand:	3
Calibration Date:	2023-02-03	Procedure:	POS-CAL-005
Instrument ID:	SBI-347	Decision rule:	Method #3

### Standard equipment used for final calibration

Description	Model	Serial #	Traceability	Due date
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2403	1500339201	2023-09-06
Fluke molbloc_100 slpm	2E2-S	380	1500341894	2023-10-19
Fluke molbox 1+	Molbox 1+	755+	1500336282	2023-07-21
RTD Mist	M22	3061002	2022005164	2023-06-27
Module 44.5 PSI avec Baro 163671	Module 30	160659	2022003929	2023-05-13

### Final specifications of the device under test

### Calibration conditions

Gas	Air	Gas	Air
Operation temperature		Ambient temperature	22 °C
Inlet pressure		Ambient pressure	1015.76 mbar
Outlet pressure		Orientation	Horizontal
Reference temperature		Seals	
Reference pressure		Valve	
Range	0-200 ACFH		
Input/Output Signals	-		
Supply			
Accuracy	±2 %F.S.		

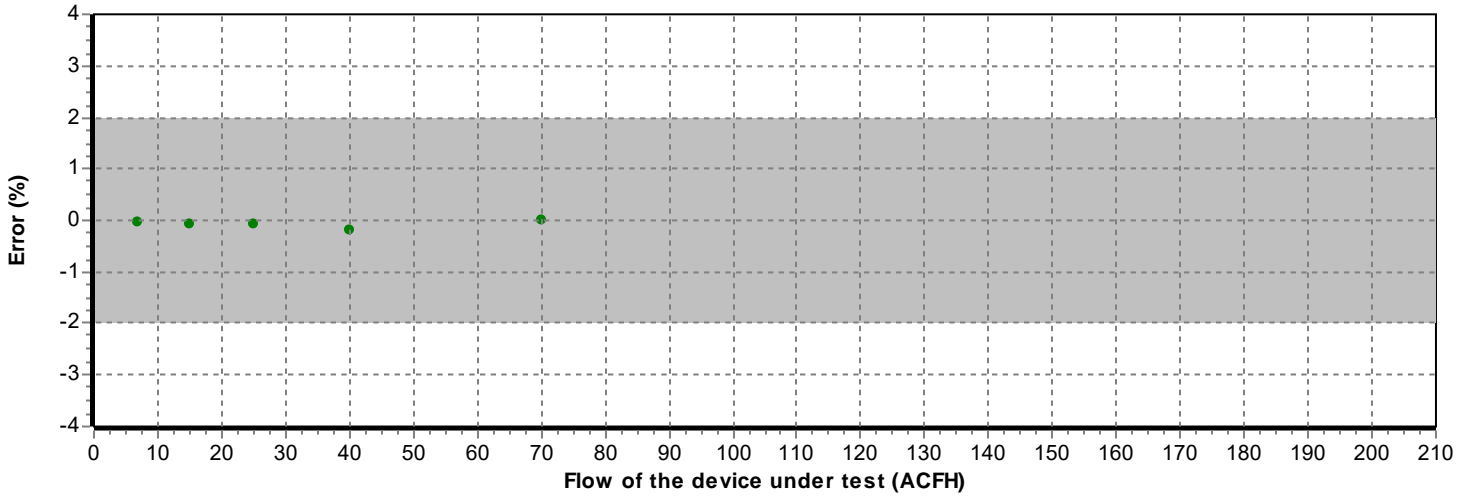
### Final readings

Test Flow ACFH	Device under test ft <sup>3</sup>	Measured values			Calculated Reference ft <sup>3</sup>	Calculated Error ft <sup>3</sup>	Acceptable Error ft <sup>3</sup>	Uncertainty k = 2 ft <sup>3</sup>	TUR
		Pressure PSIA	Temperature °C	Reference ft <sup>3</sup>					
7.0050	1.1500	14.746	22.06	1.1650	1.1648	-0.0148	0.6651	0.0048	>4
15.0146	2.4750	14.752	21.99	2.5015	2.4994	-0.0244	0.6659	0.0088	>4
24.9891	4.1300	14.757	21.96	4.1664	4.1610	-0.0310	0.6661	0.0141	>4
40.0062	6.6100	14.768	21.95	6.6820	6.6686	-0.0586	0.6668	0.0223	>4
70.1080	11.6600	14.792	21.99	11.7060	11.6648	-0.0048	0.6655	0.0288	>4

**Calibration certificate # 18721**

Serial Number:	25125397	Test stand:	3
Calibration Date:	2023-02-03	Procedure:	POS-CAL-005
Instrument ID:	SBI-347	Decision rule:	Method #3

**Final results**



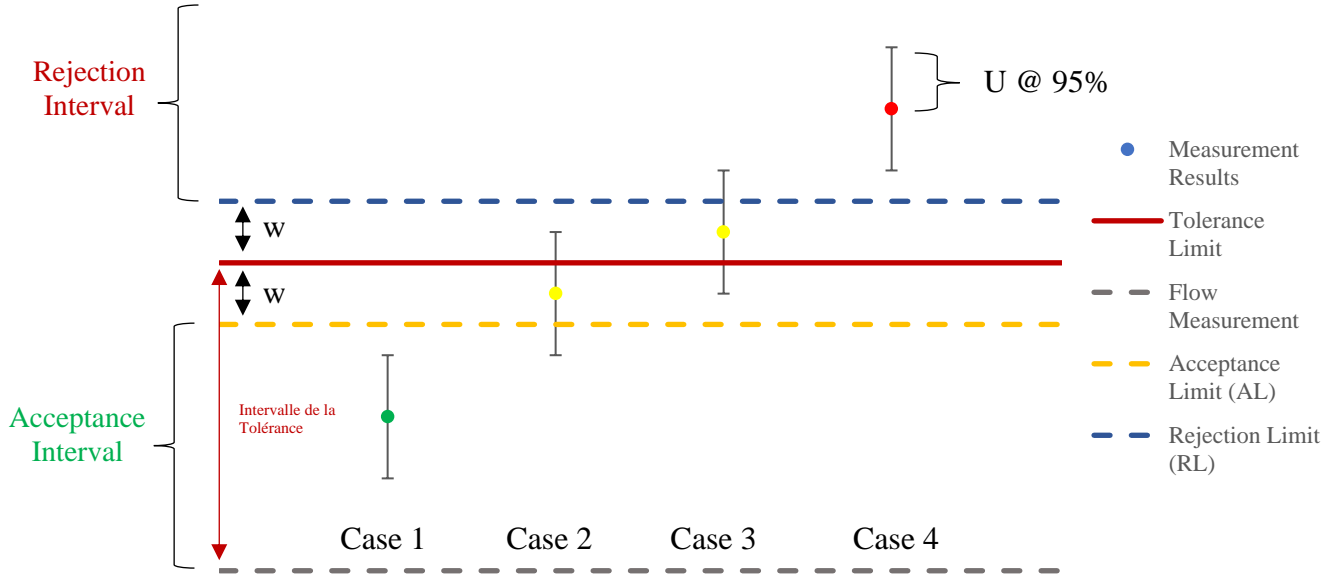
See the appendix for the guideline of decision rule

*Appendix for the decision rule*

**Method #3 Non-binary Statement with Guard Band, uncertainty directly taken into account**

This decision rule uses a guard band to define the acceptance and rejection interval. The acceptance limit is defined by the following mathematical formula  $AL = TL - w$  and the rejection limit  $RL = TL + w$ , where  $w = rU$ . The multiple  $r$  that is multiplied by the expanded measurement uncertainty  $U$  can be defined following ILAC G8: 2019 table 1 section 5.2. The expanded measurement uncertainty  $U$  has a 95% coverage probability ( $k = 2$ ). Non-binary statement with guard band exists when the result is limited to four choices: pass, conditional pass, conditional fail, and fail.

Statements of conformity are reported as:



*Graphical representation of a Non-Binary Statement with a Guard Band*

**Case 1 – Below acceptance limit AL**

**Status: In tolerance**

- The result is inside the acceptance interval. However, assuming a normal distribution, the risk that the result is outside the tolerance limit could be up to 2.5%. Uncertainty is directly taken into account. **Green**.

**Case 2 – Below tolerance limit TL, greater than acceptance limit AL**

**Status: In tolerance-Conditional**

- The result is outside the acceptance interval but below tolerance limit. However, the observed value is inside the guard band  $w = TL - AL$  and the status is conditional on the customer’s risk assessment. Uncertainty is directly taken into account. **Yellow**.

**Case 3 – Greater than tolerance limit, below rejection limit RL**

**Status: Out of tolerance-Conditional**

- The result is greater than tolerance limit but outside the rejection interval. However, the observed value is inside the guard band  $w = TL - RL$  and the status is conditional on the customer’s risk assessment. Uncertainty is directly taken into account. **Yellow**.

**Case 4 – Greater than rejection limit RL**

**Status: Out of tolerance**

- The result is inside the rejection interval. Uncertainty is directly taken into account. **Red**.

## CALIBRATION CERTIFICATE # 18716

Calibration date : 2023-02-03  
Certificate issued : 2023-02-03

**Stove Builder International**  
250, rue de Copenhague  
Saint-Augustin-de-Desmaures, Québec, Canada  
G3A 2H3

Calibration of  
Volumetric flow meter Sensus S-275 S/N : 25125396

### QUALITY PROGRAM CONFORMANCE

All calibrations are performed in accordance with Polycontrols Laboratory Quality Assurance Manual and conform to ISO/IEC 17025: 2017, ISO 9001 – 2015 and/or other quality requirements defined in customers purchase descriptions. The results are strictly valid for the device under test or calibration. If applicable, the decision rule is described in the certificate.

### TRACEABILITY

The traceability for flow standard to the National Institute of Standards and Technology, NIST, is maintained by Fluke Corporation of Phoenix, Arizona and conform to ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO-10012-1 and MIL-STD 45662A.

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither CLAS nor SCC guarantee the accuracy of individual calibrations by accredited laboratories.

### CALIBRATION OF MEASURING AND TEST EQUIPMENT

For calibration measurement capability, please refer to the Canadian Calibration Network web page at the National Research Council of Canada. This laboratory is accredited by the Standards Council of Canada as part of the Calibration Laboratory Assessment Service (CLAS) program and is listed at [nrc.canada.ca](http://nrc.canada.ca).

This document forms part of the Certificate of Accreditation issued by the Standards Council of Canada (SCC). The original version is available in the Directory of Accredited Laboratories on the SCC website at [www.scc.ca](http://www.scc.ca).

### CONDITION SUMMARY OF THE DEVICE UNDER TEST

Initial conditions	In good condition
Work done	Calibration of the instrument Initial readings = Final readings, no adjustment
Results	Final readings in tolerance
Remarks	Calibration frequency every 6 months

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Bernard Poirier  
Metrologist

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Laboratory Manager



## Calibration certificate # 18716

Serial Number:	25125396	Test stand:	3
Calibration Date:	2023-02-03	Procedure:	POS-CAL-005
Instrument ID:	SBI-346	Decision rule:	Method #3

### Standard equipment used for final calibration

Description	Model	Serial #	Traceability	Due date
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2403	1500339201	2023-09-06
Fluke molbloc_100 slpm	2E2-S	380	1500341894	2023-10-19
Fluke molbox 1+	Molbox 1+	755+	1500336282	2023-07-21
RTD Mist	M22	3061002	2022005164	2023-06-27
Module 44.5 PSI avec Baro 163671	Module 30	160659	2022003929	2023-05-13

### Final specifications of the device under test

### Calibration conditions

Gas	Air	Gas	Air
Operation temperature	20 °C	Ambient temperature	21 °C
Inlet pressure		Ambient pressure	1012.71 mbar
Outlet pressure		Orientation	Horizontal
Reference temperature		Seals	
Reference pressure		Valve	
Range	0-200 ACFH		
Input/Output Signals	-		
Supply			
Accuracy	±2 %F.S.		

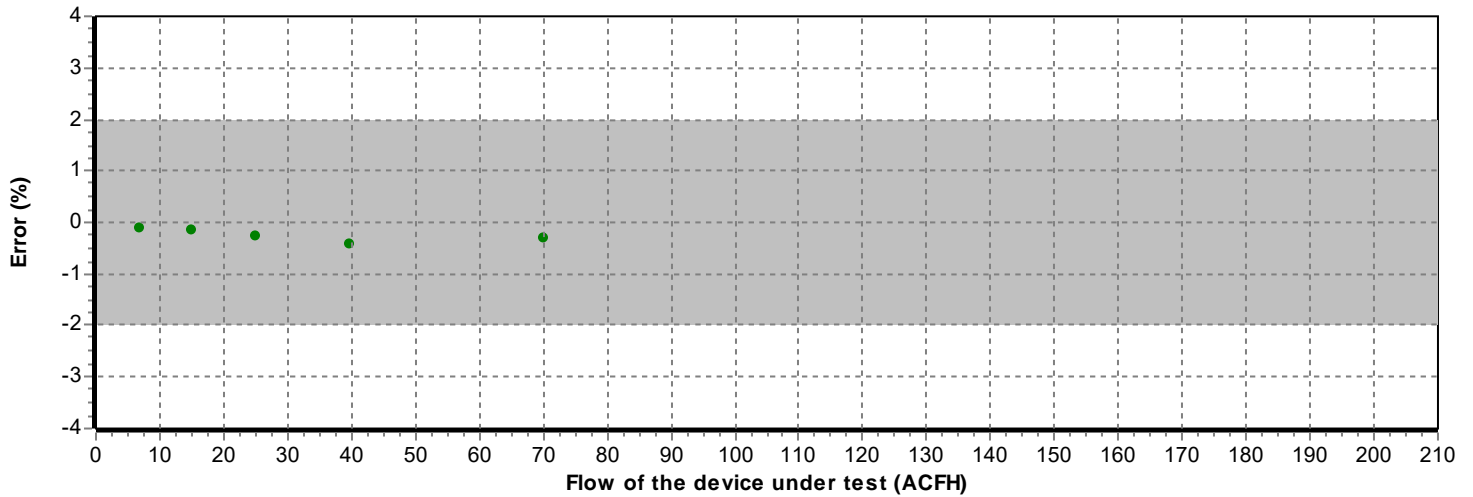
### Final readings

Test Flow ACFH	Device under test ft <sup>3</sup>	Measured values			Calculated Reference ft <sup>3</sup>	Calculated Error ft <sup>3</sup>	Acceptable Error ft <sup>3</sup>	Uncertainty k = 2 ft <sup>3</sup>	TUR
		Pressure PSIA	Temperature °C	Reference ft <sup>3</sup>					
7.0160	1.1325	14.739	21.85	1.1690	1.1685	-0.0360	0.6662	0.0049	>4
15.1512	2.4650	14.738	21.81	2.5209	2.5197	-0.0547	0.6652	0.0089	>4
25.0790	4.0850	14.725	21.52	4.1786	4.1762	-0.0912	0.6661	0.0142	>4
39.8884	6.5050	14.730	21.36	6.6567	6.6471	-0.1421	0.6666	0.0223	>4
70.0223	11.5400	14.736	20.47	11.7030	11.6461	-0.1061	0.6653	0.0286	>4

## Calibration certificate # 18716

Serial Number:	25125396	Test stand:	3
Calibration Date:	2023-02-03	Procedure:	POS-CAL-005
Instrument ID:	SBI-346	Decision rule:	Method #3

### Final results



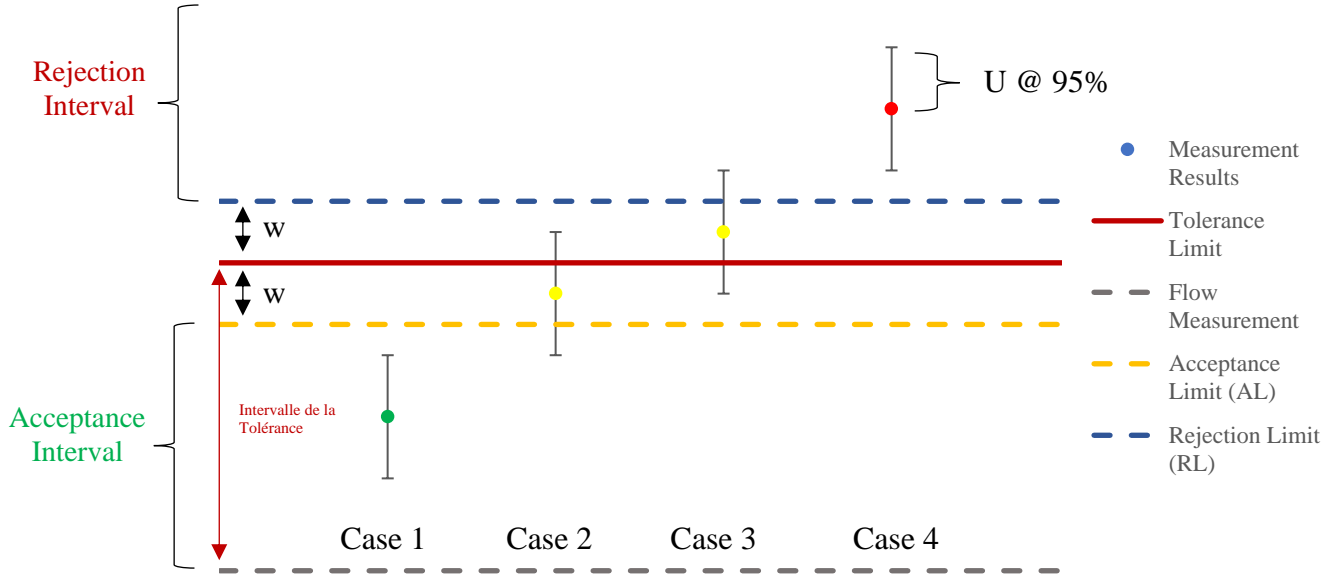
See the appendix for the guideline of decision rule

*Appendix for the decision rule*

**Method #3 Non-binary Statement with Guard Band, uncertainty directly taken into account**

This decision rule uses a guard band to define the acceptance and rejection interval. The acceptance limit is defined by the following mathematical formula  $AL = TL - w$  and the rejection limit  $RL = TL + w$ , where  $w = rU$ . The multiple  $r$  that is multiplied by the expanded measurement uncertainty  $U$  can be defined following ILAC G8: 2019 table 1 section 5.2. The expanded measurement uncertainty  $U$  has a 95% coverage probability ( $k = 2$ ). Non-binary statement with guard band exists when the result is limited to four choices: pass, conditional pass, conditional fail, and fail.

Statements of conformity are reported as:



*Graphical representation of a Non-Binary Statement with a Guard Band*

**Case 1 – Below acceptance limit AL**

**Status: In tolerance**

- The result is inside the acceptance interval. However, assuming a normal distribution, the risk that the result is outside the tolerance limit could be up to 2.5%. Uncertainty is directly taken into account. **Green**.

**Case 2 – Below tolerance limit TL, greater than acceptance limit AL**

**Status: In tolerance-Conditional**

- The result is outside the acceptance interval but below tolerance limit. However, the observed value is inside the guard band  $w = TL - AL$  and the status is conditional on the customer’s risk assessment. Uncertainty is directly taken into account. **Yellow**.

**Case 3 – Greater than tolerance limit, below rejection limit RL**

**Status: Out of tolerance-Conditional**

- The result is greater than tolerance limit but outside the rejection interval. However, the observed value is inside the guard band  $w = TL - RL$  and the status is conditional on the customer’s risk assessment. Uncertainty is directly taken into account. **Yellow**.

**Case 4 – Greater than rejection limit RL**

**Status: Out of tolerance**

- The result is inside the rejection interval. Uncertainty is directly taken into account. **Red**.

## CALIBRATION CERTIFICATE

**Certificate no.:** 896470  
**Identification:** SBI-310  
**Description:** THERMO-HYGROMETER, AMPROBE TH-3  
**Manufacturer:** AMPROBE  
**Model no.:** TH-3  
**Serial no.:** 170201693

**Calibration date:** December 14, 2022  
**Certificate issued:** December 14, 2022  
**Interval:** 12 months  
**Due date:** December 14, 2023  
**Procedure no.:** METCAL-U rev. 2  
**Procedure date:** 2019-02-07  
**Environment:** CLAS Type 2 Laboratory  
**Temperature:** 23 ± 2°C  
**Humidity:** 35 - 55% RH  
**Metrologist:** NIN

**Property of:** SBI  
250 RUE DE COPENHAGUE  
ST-AUGUSTIN-DE-DESMAURES, QC G3A 2H3

**Approved by:**   
David Llorens, Quality Manager

*This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-09 Revision 9. Measurement results provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the C. Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which Canada has an equivalence agreement.*

### CALIBRATION STANDARDS

See notes below.

### MEASUREMENT UNCERTAINTY

The uncertainties are expanded using a coverage factor  $K=2$  for a level of confidence of approximately 95%, assuming a normal distribution.

### CALIBRATION DATA

See next page for measurement results.



**Ulrich Métrologie inc.**  
**Ulrich Metrology Inc.**  
 9900, Côte-de-Liesse  
 Montréal (Québec) H8T 1A1

Tél. (514) 631-6653  
 Fax (514) 631-6122  
 info@ulrich.ca  
 www.ulrich.ca

## CALIBRATION DATA

Certificate No.: 896470

<b>Identification:</b> SBI-310	<b>Result:</b> PASS
<b>Description:</b> THERMO-HYGROMETER	<b>Condition:</b> FOUND-LEFT
<b>Serial no.:</b> 170201693	
<b>Procedure:</b> Amprobe TH-3: 2500ST-LT-M	

### CALIBRATION STANDARDS

Standard ID	Type	Manufacturer	Model no.	Cal. Date	Due Date
1304953	HUMIDITY GENERATOR	THUNDER SCIENTIFIC	2500ST-LT	2022-08-10	2024-02-29

### MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TEST	ACCEPTANCE LIMITS		UNITS	Exp Uncert	Condition
	RESULT	LOW	HIGH			
<b>TEMPERATURE CALIBRATION</b>						
23°C						
23.000 °C	22.90	22.20	23.80	°C	1.0e-001°C	Pass
<b>RELATIVE HUMIDITY CALIBRATION AT 23°C</b>						
20% RH						
20.000 %	19.10	17.00	23.00	%	6.0e-001%	Pass
50% RH						
50.000 %	49.80	47.00	53.00	%	6.0e-001%	Pass
80% RH						
80.000 %	77.70	77.00	83.00	%	6.0e-001%	Pass

End of Test Data



# CERTIFICATE OF CALIBRATION



Certificate Number: 2023001261

Page 1 of 2

<b>Manufacturer:</b>	Dwyer Instruments Inc.	<b>RMA:</b>	AC23021162
<b>Model:</b>	626-06-GH-P1-E1-S1	<b>Workorder:</b>	2023001261
<b>Description:</b>	Pressure Transmitter	<b>Barcode:</b>	AL00024176-P
<b>Serial:</b>	N/A	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	SBI-299	<b>Calibration Date:</b>	23-Feb-2023
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	23-Feb-2024
		<b>Temperature:</b>	20.56°C
		<b>Humidity:</b>	15.8%RH

**STATEMENT OF UNCERTAINTY:** The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor  $K = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this Instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCCL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

Functional tests are not covered by our scope of accreditation.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Multimeter	Fluke 8845A	ELC-MTR-04	21-Feb-2023	21-Feb-2024
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	14-Jun-2022	30-Jun-2023

**Notes:** None.

Performed by:

Anthony Morra

Technician

(digitally signed on 23-Feb-2023 3:39 pm)

QA Reviewed by:

Slava Peciurov

Lab Manager

(digitally signed on 23-Feb-2023 4:11 pm)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

Procedure: Pressure Transmitter: psi/4-20mA: CAL VER /PPC3,8845 (1.1.A)

FOUND-LEFT (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Calibrated in the vertical position.							
Range: 0 to 5 psi							
Output: 4-20 mA							
PRESSURE TEST							
Output=4.043 mA							
0.0000 psi	0.0000 psi	0.013 psi	±0.0300 psi	-0.030 psi	0.030 psi	Pass	4.5e-003 psi
Output=8.007 mA							
1.2500 psi	1.2500 psi	1.252 psi	±0.0300 psi	1.220 psi	1.280 psi	Pass	5.8e-003 psi
Output=12.004 mA							
2.5000 psi	2.5000 psi	2.501 psi	±0.0300 psi	2.470 psi	2.530 psi	Pass	7.0e-003 psi
Output=16.02 mA							
3.7500 psi	3.7500 psi	3.756 psi	±0.0300 psi	3.720 psi	3.780 psi	Pass	8.2e-003 psi
Output=20.064 mA							
5.0000 psi	5.0000 psi	5.020 psi	±0.0300 psi	4.970 psi	5.030 psi	Pass	9.5e-003 psi
Output=16.034 mA							
3.7500 psi	3.7500 psi	3.761 psi	±0.0300 psi	3.720 psi	3.780 psi	Pass	8.2e-003 psi
Output=12.013 mA							
2.5000 psi	2.5000 psi	2.504 psi	±0.0300 psi	2.470 psi	2.530 psi	Pass	7.0e-003 psi
Output=8.001 mA							
1.2500 psi	1.2500 psi	1.250 psi	±0.0300 psi	1.220 psi	1.280 psi	Pass	5.8e-003 psi
Output=4.044 mA							
0.0000 psi	0.0000 psi	0.013 psi	±0.0300 psi	-0.030 psi	0.030 psi	Pass	4.5e-003 psi

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2023000439

Page 1 of 2

<b>Manufacturer:</b>	Dwyer Instruments Inc.	<b>RMA:</b>	AC23011212
<b>Model:</b>	626-06-GH-PA-E1-S1	<b>Workorder:</b>	2023000439
<b>Description:</b>	Pressure Transmitter	<b>Barcode:</b>	AL00023736-P
<b>Serial:</b>	N/A	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	SBI-298	<b>Calibration Date:</b>	06-Feb-2023
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	06-Feb-2024
		<b>Temperature:</b>	21.96°C
		<b>Humidity:</b>	17.1%RH

**STATEMENT OF UNCERTAINTY:** The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor  $K = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCCL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

Functional tests are not covered by our scope of accreditation.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Multimeter	Fluke 8845A	ELC-MTR-04	12-Jan-2022	28-Feb-2023
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	14-Jun-2022	30-Jun-2023

Notes: None

Performed by:

Tony Wheaton

Technician

(digitally signed on 06-Feb-2023 11:16 am)

QA Reviewed by:

Slava Peciurov

Lab Manager

(digitally signed on 06-Feb-2023 1:32 pm)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001



Procedure: Pressure Transmitter: psi/4-20mA: CAL VER /PPC3,8845 (1.1.A)

FOUND-LEFT (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Calibrated in the vertical position.							
Range: 0 to 5 psi							
Output: 4-20 mA							
PRESSURE TEST							
Output=4.119 mA							
0.0000 psi	0.0000 psi	0.037 psi	±0.0400 psi	-0.040 psi	0.040 psi	Pass	4.6e-003 psi
Output=8.11 mA							
1.2500 psi	1.2500 psi	1.284 psi	±0.0400 psi	1.210 psi	1.290 psi	Pass	5.8e-003 psi
Output=12.102 mA							
2.5000 psi	2.5000 psi	2.532 psi	±0.0400 psi	2.460 psi	2.540 psi	Pass	7.0e-003 psi
Output=16.092 mA							
3.7500 psi	3.7500 psi	3.779 psi	±0.0400 psi	3.710 psi	3.790 psi	Pass	8.2e-003 psi
Output=20.116 mA							
5.0000 psi	5.0000 psi	5.036 psi	±0.0400 psi	4.960 psi	5.040 psi	Pass	9.5e-003 psi
Output=16.091 mA							
3.7500 psi	3.7500 psi	3.779 psi	±0.0400 psi	3.710 psi	3.790 psi	Pass	8.2e-003 psi
Output=12.074 mA							
2.5000 psi	2.5000 psi	2.523 psi	±0.0400 psi	2.460 psi	2.540 psi	Pass	7.0e-003 psi
Output=8.063 mA							
1.2500 psi	1.2500 psi	1.270 psi	±0.0400 psi	1.210 psi	1.290 psi	Pass	5.8e-003 psi
Output=4.116 mA							
0.0000 psi	0.0000 psi	0.037 psi	±0.0400 psi	-0.040 psi	0.040 psi	Pass	4.6e-003 psi

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2023001260

Page 1 of 2

<b>Manufacturer:</b>	Dwyer Instruments Inc.	<b>RMA:</b>	AC23021162
<b>Model:</b>	MS-121-LCD	<b>Workorder:</b>	2023001260
<b>Description:</b>	Digital Pressure Gauge	<b>Barcode:</b>	AL0015070-P
<b>Serial:</b>	E52U0100523	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	SBI-250	<b>Calibration Date:</b>	27-Feb-2023
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	27-Feb-2024
		<b>Temperature:</b>	21.89°C
		<b>Humidity:</b>	16.3%RH

**STATEMENT OF UNCERTAINTY:** The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor  $K = 2$ , which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

Functional tests are not covered by our scope of accreditation.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Multimeter	Fluke 8845A	ELC-MTR-04	21-Feb-2023	21-Feb-2024
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	07-Mar-2022	31-Mar-2023

**Notes:** Bad display segment second ms digit.

Performed by:

Anthony Morra

Technician

(digitally signed on 27-Feb-2023 1:11 pm)

QA Reviewed by:

Slava Peciurov

Lab Manager

(digitally signed on 27-Feb-2023 3:29 pm)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

Alpha Controls & Instrumentation Inc., Suite 6, 361 Steelcase Road West, Markham, Ontario L3R 3V8 www.alphacontrols.com (800) 567-8686

Procedure: Dwyer MS-121-LCD: 0-0.25 inH2O /7520LP,8845A (1.0.A)

Found / Left (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Range: 0 to 0.25 inH2O							
Output signal: 4 to 20 mA							
PRESSURE TEST							
Display Reading						.001	
Output @ 0.0000 inH2O, mA						4.01	
0.0000 inH2O	0.0000 inH2O	0.0005 inH2O	±0.0025 inH2O	-0.0025 inH2O	0.0025 inH2O	Pass	1.5e-004 inH2O
Display Reading						.061	
Output @ 0.0625 inH2O, mA						7.9	
0.0625 inH2O	0.0625 inH2O	0.0610 inH2O	±0.0025 inH2O	0.0600 inH2O	0.0650 inH2O	Pass	1.5e-004 inH2O
Display Reading						.1230	
Output @ 0.1250 inH2O, mA						11.87	
0.1250 inH2O	0.1250 inH2O	0.1230 inH2O	±0.0025 inH2O	0.1225 inH2O	0.1275 inH2O	Pass	1.5e-004 inH2O
Display Reading						.186	
Output @ 0.1875 inH2O, mA						15.904	
0.1875 inH2O	0.1875 inH2O	0.1860 inH2O	±0.0025 inH2O	0.1850 inH2O	0.1900 inH2O	Pass	1.5e-004 inH2O
Display Reading						.24	
Output @ 0.2500 inH2O, mA						19.872	
0.2500 inH2O	0.2500 inH2O	0.2480 inH2O	±0.0025 inH2O	0.2475 inH2O	0.2525 inH2O	Pass	1.5e-004 inH2O
Display Reading						.1861	
Output @ 0.1875 inH2O, mA						15.91	
0.1875 inH2O	0.1875 inH2O	0.1861 inH2O	±0.0025 inH2O	0.1850 inH2O	0.1900 inH2O	Pass	1.5e-004 inH2O
Display Reading						.123	
Output @ 0.1250 inH2O, mA						11.872	
0.1250 inH2O	0.1250 inH2O	0.1230 inH2O	±0.0025 inH2O	0.1225 inH2O	0.1275 inH2O	Pass	1.5e-004 inH2O
Display Reading						.0615	
Output @ 0.0625 inH2O, mA						7.936	
0.0625 inH2O	0.0625 inH2O	0.0615 inH2O	±0.0025 inH2O	0.0600 inH2O	0.0650 inH2O	Pass	1.5e-004 inH2O
Display Reading						.001	
Output @ 0.0000 inH2O, mA						4.058	
0.0000 inH2O	0.0000 inH2O	0.0010 inH2O	±0.0025 inH2O	-0.0025 inH2O	0.0025 inH2O	Pass	1.5e-004 inH2O

END OF CERTIFICATE

Mettler-Toledo Inc.  
Service Division  
1900 Polaris Parkway  
Columbus, OH 43240  
1-800-METTLER



Accredited by the American Association  
for Laboratory Accreditation (A2LA)  
CALIBRATION CERT #1788.01

ISO 17025 Accredited  
ANSI/NCSL Z540-1 Accredited

## Certificat de Calibration de Précision

### Accuracy Calibration Certificate

#### Client

**Compagnie:** SBI Fabricant De Poeles  
**Adresse:** 250 rue de Copenhague  
**Ville:** Saint-Augustin-de-Desmaures **Contact:** André Bouchard  
**Zip/Code Postal:** G3A 2H3  
**État/Province:** Quebec

#### Weighing Device

**Manufacturier:** SARTORIUS **Type d'Instrument:** Weighing Instrument  
**Modèle:** TE214S **# Outil:** SBI-206 BAL. ANALYTIQUE  
**No. Série:** 25851066 **Modèle Indicateur:** N/D  
**Building:** N/D **Terminal Serial No.:** N/D  
**Floor:** N/D **Terminal Asset No.:** N/D  
**Room:** N/D

Plage	Capacité Max	Lisibilité (d)
1	210 g	0.0001 g

#### Procedure

**Instruction de Calibration:** ASTM E898 - 20  
**Instruction de travail METTLER TOLEDO:** 30260953

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

Ce certificat de calibration contient des mesures pour les calibrations Tel que Trouvé et Tel que Laissé.

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

	Temperature		Humidity	
Tel que Trouvé	Start: 71.2 °F	End: 70.7 °F	Start: 30.0 %	End: 32.0 %
Tel que Laissé	Start: 70.9 °F	End: 70.7 °F	Start: 33.0 %	End: 33.0 %

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

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

**Date calibration Tel que Trouvé:** 16-03-2023  
**Date calibration Tel que Laissé:** 16-03-2023  
**Date d'Émission:** 16-03-2023  
**Requested Next Calibration Date:** 31-03-2024

**Authorized A2LA Signatory:**

Dany Careau

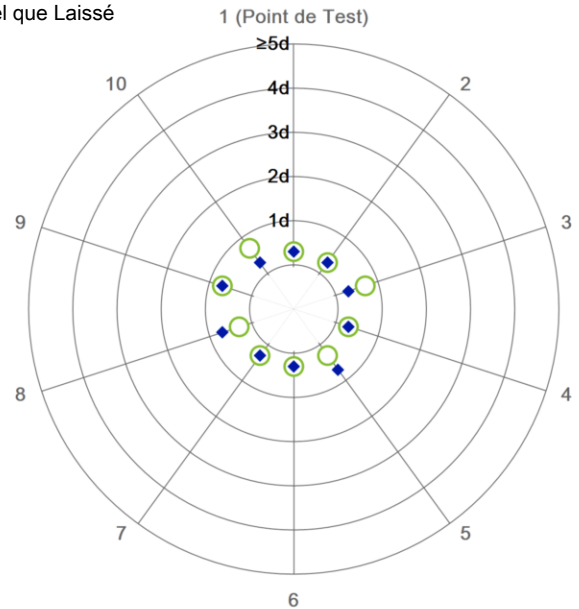
## Résultats de Mesure

### Répétabilité

Charge de Test: 100 g

	Tel que Trouvé	Tel que Laissé
1	100.0001 g	100.0001 g
2	100.0001 g	100.0001 g
3	100.0000 g	100.0001 g
4	100.0001 g	100.0001 g
5	100.0001 g	100.0000 g
6	100.0001 g	100.0001 g
7	100.0001 g	100.0001 g
8	100.0001 g	100.0000 g
9	100.0000 g	100.0000 g
10	100.0000 g	100.0001 g

○ Tel que Trouvé  
◆ Tel que Laissé



Écart Type	0.00005 g	0.00005 g
------------	-----------	-----------

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

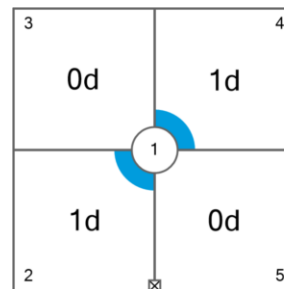
The results of this graph are based upon the absolute values of the differences from the mean value.

### Excentricité

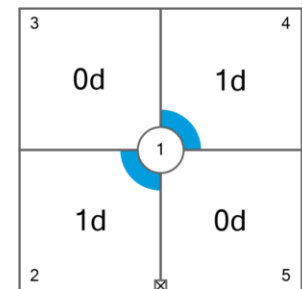
Charge de Test: 100 g

Position	Tel que Trouvé	Tel que Laissé
1	100.0000 g	100.0000 g
2	100.0001 g	100.0001 g
3	100.0000 g	100.0000 g
4	100.0001 g	100.0001 g
5	100.0000 g	100.0000 g

Déviaton Maximale	0.0001 g	0.0001 g
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Tel que Trouvé



Tel que Laissé

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

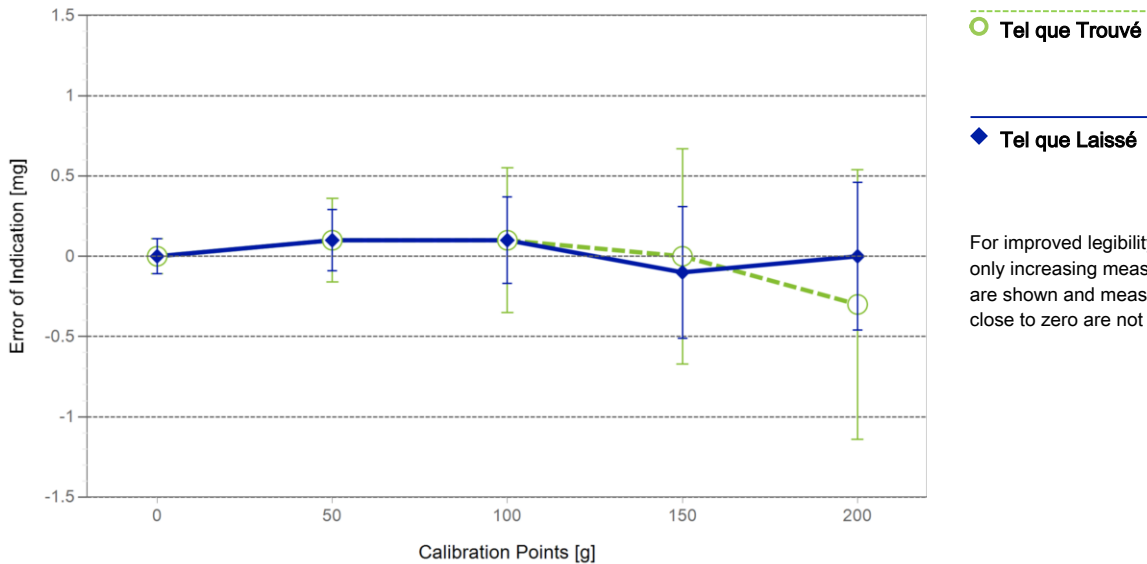
### Erreur d'indication

Tel que Trouvé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0.0000 g	0.0000 g	0.0000 g	0.11 mg	2
2	50.0000 g	50.00001 g	0.0001 g	0.26 mg	2
3	100.0000 g	100.00001 g	0.0001 g	0.45 mg	2
4	150.0001 g	150.00001 g	0.0000 g	0.67 mg	2
5	200.0000 g	199.9997 g	-0.0003 g	0.84 mg	2

**Tel que Laissé**

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0.0000 g	0.0000 g	0.0000 g	0.11 mg	2
2	50.0000 g	50.0001 g	0.0001 g	0.19 mg	2
3	100.0000 g	100.0001 g	0.0001 g	0.27 mg	2
4	150.0001 g	150.0000 g	-0.0001 g	0.41 mg	2
5	200.0000 g	200.0000 g	0.0000 g	0.46 mg	2



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

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

**Test Equipment**

Tous les poids utilisés pour le contrôle métrologique sont retraçables aux étalons Nationaux et Internationaux. Les poids ont été calibrés et certifiés par un laboratoire de calibration accrédité.

**Jeu de Poids 1: OIML E2**

Weight Set Number: 427 Date d'Émission: 10-03-2022  
 # Certificat: 220563348-1 Date de Calibration Due: 31-03-2023

**Remarques**

N/D

**End of Accredited Section**

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

## Incertitude de Mesure du dispositif de pesage en opération

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

Coefficient de température pour l'évaluation de l'incertitude de mesure en opération:  $3.0 \cdot 10^{-6} / K$

Plage d'opération sur le site pour l'évaluation de l'incertitude de mesure en opération:  $5 \text{ }^\circ F$

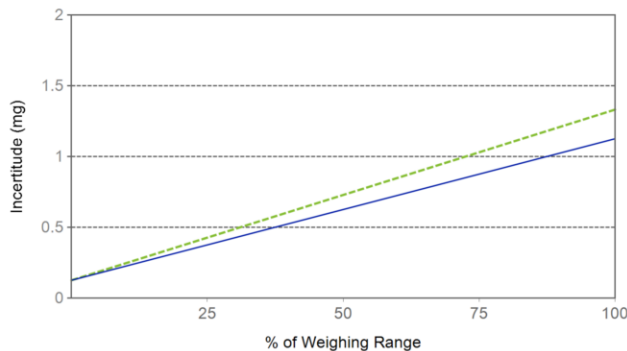
### Linéarisation de l'Équation d'Incertitude

Plage			Tel que Trouvé	Tel que Laissé
	d	Max		
1	0.0001 g	210 g	$U_1 = 0.13 \text{ mg} + 0.00574 \text{ mg/g} \cdot R$	$U_1 = 0.13 \text{ mg} + 0.00476 \text{ mg/g} \cdot R$

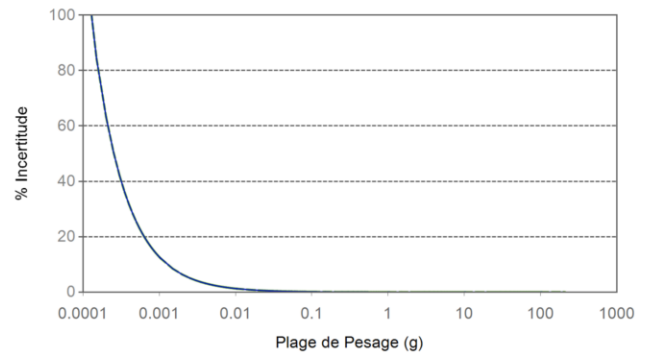
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

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

Indication Net	Tel que Trouvé		Tel que Laissé	
	Value	%	Value	%
0.0210 g	0.13 mg	0.62%	0.13 mg	0.62%
0.2100 g	0.13 mg	0.062%	0.13 mg	0.062%
2.1000 g	0.14 mg	0.0068%	0.14 mg	0.0067%
21.0000 g	0.25 mg	0.0012%	0.23 mg	0.0011%
210.0000 g	1.3 mg	0.00064%	1.1 mg	0.00054%



Tel que Trouvé



Tel que Laissé

# Handbook 44 Tolerance Assessment(Entretien)

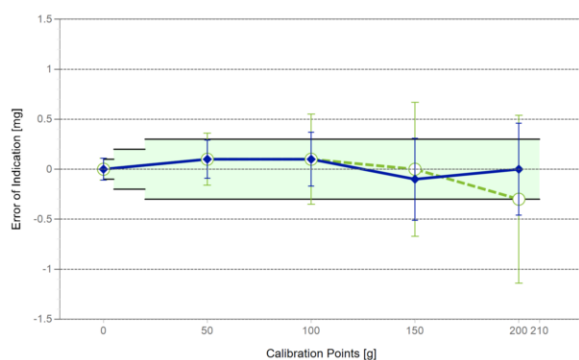
Assessment done without considering measurement uncertainty.

Les mesures du certificat de calibration joint ont été évaluées selon les tolérances définies par NIST HB44.

Tel que Trouvé
Tel que Laissé
✓ = Passed  
✗ = Failed

## Weighing Device

Range	Max. Capacity	Readability (d)	Verification Scale Interval (e)	Class
1	210 g	0.0001 g	0.0001 g	I



Tolerances according to NIST Handbook 44

Test Load		Tolérance
From	To	
0.0000 g	0.0000 g	0.000025 g
0.0001 g	5.0000 g	0.0001 g
5.0001 g	20.0000 g	0.0002 g
20.0001 g	210.0000 g	0.0003 g

○ Tel que Trouvé

◆ Tel que Laissé

— Tolérance

## Eccentricity and Repeatability

Test	Test Load	Tolérance	As Found		As Left	
			Max. Error / Range	Result	Max. Error / Range	Result
Excentricité (Maximum Error)	100 g	0.0003 g	0.0001 g	✓	0.0001 g	✓
Excentricité (Plage)	100 g	0.0003 g	0.0001 g	✓	0.0001 g	✓
Répétabilité (Maximum Error)	100 g	0.0003 g	0.0001 g	✓	0.0001 g	✓
Répétabilité (Plage)	100 g	0.0003 g	0.0001 g	✓	0.0001 g	✓

**Max. Error:** Maximum of the absolute values of the individual errors.

**Range:** Difference between largest and smallest measurement value.

## Error of Indication

	Reference Value	Tolérance	As Found		As Left	
			Error of Indication	Result	Error of Indication	Result
1	0.0000 g	0.0001 g	0.0000 g	✓	0.0000 g	✓
2	50.0000 g	0.0003 g	0.0001 g	✓	0.0001 g	✓
3	100.0000 g	0.0003 g	0.0001 g	✓	0.0001 g	✓
4	150.0001 g	0.0003 g	0.0000 g	✓	-0.0001 g	✓
5	200.0000 g	0.0003 g	-0.0003 g	✓	0.0000 g	✓



SBI-369



## CERTIFICATE OF ANALYSIS

**Customer:** SBI FABRICANT DE POELES  
INTERNATIONAL INC  
250 RUE DE COPENHAGUE  
SAINT-AUGUSTIN-DE-DESMAURES QC  
G3A 2H3

**Analysis Date:** 8/15/2022 1:36:34PM  
**Product code:** A1342174  
**Grade:** CERTIFIED  
**Size:** 7AL  
**CGA #:** 350

**Servitrax barcode No:** T2WM181  
**Work order number:** 1663338  
**Pressure:** 2000 psig  
**Volume:** 0.821 M3  
**Expiry date:** 08/15/2025

COMPONENTS	NOMINAL CONCENTRATION	ANALYSIS RESULTS
CARBON MONOXIDE	4.3000 % Molar	4.35 % Molar
NITROGEN	BALANCE	BALANCE

Analysis performed by:

  
JASON NGO - CHEMIST

Verified by:



This Air Liquide Canada mixture is traceable to NIST

### METHOD OF ANALYSIS:

Method of analysis is based on principles of gas chromatography and as documented in Air Liquide Canada operating procedure, where applicable, FID, TCD, PDHID, FT-IR, FPD, NO/NOx and SO2 chemiluminescence, hygrometer, and electrochemical cells and paramagnetic cell. Detectors were used in conjunction with packed or capillary columns calibrated flow meters and dilution calibrated system.

### ANALYTICAL ACCURACY:

Quality	Concentration	Blend Tolerance	AA
PRIMARY	5%-50%	+/-1%	+/-1%
	0.5%-5%	+/-2%	
	1ppm-0.5%	+/-5%	
CERTIFIED	5%-50%	+/-5%	+/-2%
	0.5%-5%	+/-10%	
	1ppm-0.5%	+/-20%	
UNANALYZE	5%-50%	+/-10%	+/-5%
	<5%	+/-20%	

This mixture was certified by a combination of weight and analysis (depending on component) using scales certified against weights traceable to the Institute for National Measurement Standards (INMS) of the National Research Council of Canada (NRCC), Report # W-021221-13857 (MTL) and CA3033-022-050621-ACC (Calgary) or calibration standards prepared in that manner.

### How to contact us & order



E-mail within your region:

specgas.atlantic@airliquide.com  
specgas.qc@airliquide.com

specgas.on@airliquide.com  
specgas.ab@airliquide.com

specgas.midwest@airliquide.com  
specgas.pacific@airliquide.com



Customer Solution Center: 1 800 217-2688



Online 24/7 through My.Airliquide.ca



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## CERTIFICATE OF ANALYSIS

**Customer:** SBI FABRICANT DE POELES  
INTERNATIONAL INC  
250 RUE DE COPENHAGUE  
SAINT-AUGUSTIN-DE-DESMAURES QC  
G3A 2H3

<b>Analysis Date:</b>	8/3/2021 4:48:08PM	<b>Servitrax barcode No:</b>	T267TH8
<b>Product code:</b>	A1326591	<b>Work order number:</b>	1530113
<b>Grade:</b>	CERTIFIED	<b>Pressure:</b>	1450 psig
<b>Size:</b>	30AL	<b>Volume:</b>	4.32 M3
<b>CGA #:</b>	590	<b>Expiry date:</b>	08/03/2024

COMPONENTS	NOMINAL CONCENTRATION	ANALYSIS RESULTS
CARBON DIOXIDE	10.0000 % Molar	10.1 % Molar
CARBON MONOXIDE	2.0000 % Molar	1.98 % Molar
OXYGEN	8.0000 % Molar	7.99 % Molar
NITROGEN	BALANCE	BALANCE

Analysis performed by:

*Evgeny Makarov*  
EVGENY MAKAROV - CHEMIST SPQ

Verified by:

*RL*

This Air Liquide Canada mixture is traceable to NIST

**METHOD OF ANALYSIS:**

Method of analysis is based on principles of gas chromatography and as documented in Air Liquide Canada operating procedure, where applicable, FID, TCD, PDIID, FT-IR, FPD, NDIR, NOx and SO2 chemiluminescence, hygrometer, and electrochemical cells and paramagnetic cell. Detectors were used in conjunction with packed or capillary columns calibrated flow meters and dilution calibrated system.

**ANALYTICAL ACCURACY:**

Quality	Concentration	Blend Tolerance	AA
PRIMARY	5%-50%	+/-1%	+/-1%
	0.5%-5%	+/-2%	
	1ppm-0.5%	+/-5%	
CERTIFIED	5%-50%	+/-5%	+/-2%
	0.5%-5%	+/-10%	+/-2%
	1ppm-0.5%	+/-20%	+/-5%
UNANALYZE	5%-50%	+/-10%	
	<5%	+/-20%	

This mixture was certified by a combination of weight and analysis (depending on component) using scales certified against weights traceable to the Institute for National Measurement Standards (INMS) of the National Research Council of Canada (NRCC), Report # W-021221-13857 (MTL) and CA3033-022-050621-ACC (Calgary) or calibration standards prepared in that manner.

**How to contact us & order**



E-mail within your region: [specgas.atlantic@airliquide.com](mailto:specgas.atlantic@airliquide.com) [specgas.on@airliquide.com](mailto:specgas.on@airliquide.com)  
[specgas.qc@airliquide.com](mailto:specgas.qc@airliquide.com) [specgas.ab@airliquide.com](mailto:specgas.ab@airliquide.com)

[specgas.midwest@airliquide.com](mailto:specgas.midwest@airliquide.com)  
[specgas.pacific@airliquide.com](mailto:specgas.pacific@airliquide.com)



Canada 24/7: [www.airliquide.ca](http://www.airliquide.ca)



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## CERTIFICATE OF ANALYSIS

**Customer:** SBI FABRICANT DE POELES  
INTERNATIONAL INC  
250 RUE DE COPENHAGUE  
SAINT-AUGUSTIN-DE-DESMAURES QC  
G3A 2H3

<b>Analysis Date:</b>	8/6/2021 11:41:41AM	<b>Servitrex barcode No:</b>	T2L7ER7
<b>Product code:</b>	A1326555	<b>Work order number:</b>	1530112
<b>Grade:</b>	CERTIFIED	<b>Pressure:</b>	2000 psig
<b>Size:</b>	30AL	<b>Volume:</b>	4.53 M3
<b>CGA #:</b>	590	<b>Expiry date:</b>	08/06/2024

COMPONENTS	NOMINAL CONCENTRATION	ANALYSIS RESULTS
CARBON DIOXIDE	18.0000 % Molar	18.0 % Molar
CARBON MONOXIDE	4,000.0000 ppm Molar	4252 ppm Molar
OXYGEN	18.0000 % Molar	18.0 % Molar
NITROGEN	BALANCE	BALANCE

Analysis performed by:

*Evgeny Makarov*  
EVGENY MAKAROV - CHEMIST SPQ

Verified by:

*RC*

This Air Liquide Canada mixture is traceable to NIST

**METHOD OF ANALYSIS:**

Method of analysis is based on principles of gas chromatography and as documented in Air Liquide Canada operating procedure, where applicable, FID, TCD, PDHID, FT-IR, FPD, NO/NOx and SO2 chemiluminescence, hygrometer, and electrochemical cells and paramagnetic cell. Detectors were used in conjunction with packed or capillary columns calibrated, flow meters and dilution calibrated system.

**ANALYTICAL ACCURACY:**

Quality	Concentration	Blend Tolerance	AA
PRIMARY	5%-50%	+/-1%	+/-1%
	0.5%-5%	+/-2%	
	1ppm-0.5%	+/-5%	
CERTIFIED	5%-50%	+/-5%	+/-2%
	0.5%-5%	+/-10%	
	1ppm-0.5%	+/-20%	
UNANALYZE	5%-50%	+/-10%	+/-5%
	<5%	+/-20%	

This mixture was certified by a combination of weight and analysis (depending on component) using scales certified against weights traceable to the Institute for National Measurement Standards (INMS) of the National Research Council of Canada (NRCC), Report # W-021221-13857 (MTL) and CA3033-022-050621-ACC (Calgary) or calibration standards prepared in that manner.

**How to contact us & order**



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specgas.ab@airliquide.com

specgas.midwest@airliquide.com  
specgas.pacific@airliquide.com



Customer Solution Center: 1 800 217-2688



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# Certificate of Calibration

Certificate Number: **786555**



**JJ Calibrations, Inc.**

7724 SE Aspen Summit Drive

Portland, OR 97266-9217

Phone 503.786.3005

FAX 503.786.2994

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

PO: **1084**  
 Order Date: **01/18/2023**  
 Authorized By: **N/A**



Calibrated on: **01/26/2023**  
 \*Recommended Due: **01/26/2024**  
 Environment: **19 °C 40 % RH**  
 \* As Received: **Within Tolerance**  
 \* As Returned: **Within Tolerance**  
 Action Taken: **Calibrated**  
 Technician: **135**

Property #: **210**  
 User: **N/A**  
 Department: **N/A**  
 Make: **Craftsman**  
 Model: **CMHT37365**  
 Serial #: **210**  
 Description: **Tape Measure, 25'**  
 Procedure: **500614**  
 Accuracy: **± 0.0625"**

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

## Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
591A	Mitutoyo	PH-3500	Optical Comparator	09/19/2023	777417

Parameter	Measurement Description	Range Unit	Measurement Data				UUT	Uncertainty
			Reference	Min	Max	*Error		
<b>Before/After</b>							Accredited =	
<b>Length</b>								
0-1"	Inch		1.00000	0.9375	1.0625	0.0010	1.0010 Inch 1.1E-02 ✓	
299-300"	Inch		1.00000	0.9375	1.0625	0.0001	1.0001 Inch 1.1E-02 ✓	

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

Reviewer

3 Issued 01/26/2023 Rev # 15

Inspector



# QUALITY CONTROL SERVICES

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



## Report of Calibration

Firm: PFS-TECO  
Address: 11785 SE Hwy 212, Ste 305  
City/State/Zip: Clackamas, OR 97015

Test Completed: 05/09/22  
Purchase Order: 1067  
Traceable Number: 20220682

Test Item: 200 mg and 100 mg Individual Weights  
Serial No.: Listed in Table

Manufacturer: Troemner  
Customer ID: Listed in Table

<u>Material</u>	<u>Assumed Density</u>	<u>Range</u>	<u>Tolerance Class</u>
Stainless Steel	7.95 g/cm <sup>3</sup>	200 mg & 100 mg	ASTM Class 1

### Method and Traceability

The procedure used for this calibration is NIST IR 6969 SOP 4 Double Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

### Standards Used:

100 g to 1 mg Working Standards Were Calibrated: 07/02/21 Due: 07/31/22 Standards ID: 723318  
Mass Comparators Used: MET-05 Tested by: D. Thompson

**Conventional Mass:** “The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). “Conventional Value of the Result of Weighing in Air” (Previously known as “Apparent Mass vs. 8.0 g/cm<sup>3</sup>).


**Uncertainty Statement:** The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor  $k=2$  for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

page 1 of 2

Quality Control Services, Inc.  
Metrology Laboratory Manager  
E-mail [dthompson@qc-services.com](mailto:dthompson@qc-services.com)

Date: 05/09/22

  
Signature David S. Thompson

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Member: National Conference of Standards Laboratories and Weights & Measures



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## Report of Calibration

Firm: PFS-TECO  
Address: 11785 SE Hwy 212, Ste 305  
City/State/Zip: Clackamas, OR 97015

Test Completed: 05/09/22  
Purchase Order: 1067  
Traceable Number: 20220682

Test Item: 200 mg and 100 mg Individual Weights  
Serial No.: Listed in Table

Manufacturer: Troemner  
Customer ID: Listed in Table

### Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.93 to 21.94	760.7 to 760.8	47.8 to 47.9

### Conventional Mass Value

Nominal Value	As Found Value (g)	As Found Correction* (mg)	As Left Value (g)	As Left Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200 mg, 1000101395, #109-B	0.2000082	0.0082	0.2000082	0.0082	0.0014	0.010
100 mg, 1000126267, #109-A	0.1000065	0.0065	0.1000065	0.0065	0.0014	0.010

\*Correction is the difference between the conventional mass value of a weight and its nominal value.

**Comments:** These weights were received in good condition and were within ASTM Class 1 tolerances As Found.


**Recalibration Due:** The customer has requested a 5-year calibration cycle. The calibration due date for these weights is 05/09/27. The values listed above were found at the time of calibration. Any number of factors may cause these items to drift out of calibration before the calibration interval has expired.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2017 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

page 2 to 2

Quality Control Services, Inc.  
Metrology Laboratory Manager  
E-mail [dthompson@qc-services.com](mailto:dthompson@qc-services.com)

Date: 05/09/22

  
Signature David S. Thompson

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

Report Number: DIRI0134307497221214

## 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	12/14/22	6/9/22	12/2023

### FUNCTIONAL CHECKS

ECCENTRICITY		LINEARITY		STANDARD DEVIATION			ENVIRONMENTAL CONDITIONS
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:		
100	0.0003	50 x 4	0.0002	100	0.0001		<input type="checkbox"/> Good <input checked="" type="checkbox"/> Fair <input type="checkbox"/> Poor
<b>As-Found:</b>		<b>As-Found:</b>		1. 100.0002	5. 1000.0003	9. 1000.0003	Temperature: 20.6°C
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	2. 1000.0001	6. 1000.0002	10. 1000.0002	
<b>As-Left:</b>		<b>As-Left:</b>		3. 1000.0002	7. 1000.0002	<b>Result</b>	
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	4. 1000.0002	8. 1000.0003	284.60499	

### A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	200.0009	200.0004	569.20999
100	100.0005	100.0002	569.20999
50	50.0004	50.0001	569.20999
20	20.0003	20.0000	569.20999
1	1.0001	1.0000	569.20999
0.1	0.1001	0.1000	569.20999

### CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20 kg to 1mg	2831W	3/1/22	3/2023	20220382

#### Permanent Information Concerning this Equipment:

6 month calibration cycle  
1/22 Extra checkpoint to encapsulate user range 0.05g.  
AF= 0.0500g A/L= 0.0500

#### Comments/Info Concerning this Calibration:

12/22 RH= 45%. Adjusted span.

Report prepared/reviewed by: SC

Date: 12/14/22

Technician: J. Colacchio

Signature: [Signature]

THIS CERTIFICATE SHALL NOT BE REPRODUCED WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

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

# Report and Certificate of Calibration



Portland Laboratory  
5777 SE International Way  
Milwaukie, OR 97222  
800-356-4662  
503-654-9620

Anaheim Laboratory  
120 S. Chaparral Ct Suite 110  
Anaheim Hills, CA 92808  
888-700-4100  
714-696-5300

[www.Cal-Cert.com](http://www.Cal-Cert.com)

**Report #:** 25314-28785-47 **Customer PO#:** 1073  
**Customer Name:** PFS TECO  
**Customer Address:** 11785 SE Highway 212  
**City:** Clackamas **State:** OR **Zip:** 97015  
**Contact:** John Steinert  
**Service Address:** 120 S. Chaparral Court, Suite 110 Anaheim Hills, CA 92808

### Calibration Standards

2-01754   Thermo-Hygrometer   Comark   SN: 06257740553   Cal: 08/12/2022   Due: 07/31/2023   Report #: 25476-198970-3646
ACS318   Electrical Meter   Fluke   SN: 895650804   Cal: 06/26/2022   Due: 06/30/2024   Vendor: Fluke   Range: Various   Report #: EVL809627
ACS403   Electrical Meter   Extech   SN: H241956   Cal: 04/02/2022   Due: 04/30/2023   Vendor: Associated Calibration Inc.   Range: 11111110 Ohms   Report #: 23340-70023-1546

### Instrument Data

<b>Calibration Date:</b>	August 19, 2022	<b>Reference:</b>	Manufactures Tolerances
<b>Recommended Due Date:</b>	August 19, 2023	<b>Cal-Cert Procedure:</b>	CP-080
<b>Calibration Frequency:</b>	12 Months	<b>Indicating System:</b>	Gauge
<b>Manufacturer:</b>	Delmhorst	<b>Temperature:</b>	71.9 °F
<b>Type:</b>	Resistivity Meter	<b>Humidity:</b>	48% RH
<b>Model Number:</b>	MCS-1	<b>Asset #:</b>	#094
<b>Serial #:</b>	#094	<b>Service Location:</b>	Cal-Cert Lab
<b>Capacity:</b>	120 Megaohms	<b>As Found:</b>	Pass
<b>Tolerance:</b>	5.00 % of indication	<b>As Left:</b>	Pass

Instrument Range:	120 Megaohms		Resolution:	N/A		Mode Verified:	Resistance
Standard Reading	UUT As Found	UUT Reading #1	Error	UUT Reading #2	Error		
0.000	0.000	0.000	0.000	0.000	0.000		
1.100	1.095	1.095	-0.005	1.095	-0.005		
120.000	121.20	121.20	1.200	121.31	1.310		
0.000	0.000	0.000	0.000	0.000	0.000		
0.000	0.000	0.000	0.000	0.000	0.000		

**Expanded Uncertainty± 2.50 Megaohms**

### Remarks:

We sincerely thank you for your business. Please call us at 714-696-5300 for all your sales and calibration needs.  
 Cleaning and preventative maintenance were performed as part of this service.

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ANSI/NC SL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above.

Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

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**Service Engineer:** Michael Rondeau **Date:** August 19, 2022  
**Technical Manager:** Marshall Doyle **Signature:** *Mr Doyle*