



Certificate of Conformity

Issued to: England's Stove Works, Inc.
Mr. Chris Terrell
589 S. Five Forks Rd.
Monroe, VA 24574

Model: 15-W06
AKA: 50-SHW06, 50-SHW06L, 50TRW06, 15-W08, 50-SHW08, 50-SHW08L,
50TRW08

Effective Date: June 2, 2020
Revised Date*: April 29, 2021
Report # 20-601

*See revision schedule on page 2 for summary of revision history.

Certification tests were performed by PFS-TECO located at 11785 SE Highway 212, Suite 305, Clackamas, OR 97015

PFS TECO certifies conformity to the following per 40 CFR Part 60 §60.533 (f) (A):

- The test report is complete and accurate.
- The instrumentation used for the test was properly calibrated.
- The representative model tested meets the applicable emission limits.
- The tests have been conducted per the appropriate guidelines.
- The manufacturer's Quality Control Plan has been reviewed to ensure that all production units are similar in all material respects that would affect emissions to the tested/certified model and that the units in the model line will meet all (other) applicable requirements.

PFS TECO certifies that the emissions levels as measured in the test report are in compliance with the 2020 PM emission limit of ≤ 2.5 g/hr using cordwood.

The average emissions for the 15-W06 wood heater is **1.8 g/hr** with an average efficiency of **72%**. Average CO emissions are **1.9 g/min.**

Issued by: PFS TECO
11785 SE Highway 212
Suite 305
Clackamas, OR 97015

John Steinert, Vice-President -Hearth Products Division



Revision Summary

Date: June 2, 2020 – Original Issue

Date: April 29, 2021 – The following revisions to the report were reviewed:

- The notes section was edited to indicate that pre-test conditioning was performed at a medium combustion air setting, page 4.
- Appendix A was edited to correct an error in the test notes for Run 2. The test setting used was fully closed; an earlier version specified an air setting of 5/8" open, which was not used for any test, see page 110 of Non-CBI report.



England's Stove Works, Inc.

Project # 20-601

Model: 15-W06

AKA: 50-SHW06, 50-SHW06L,
50TRW06, 15-W08, 50-
SHW08, 50-SHW08L,
50TRW08

Type: Wood-Fired Room Heater

June 2, 2020

Revised Date: April 29, 2021

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

Contact: Mr. Chris Terrell
589 S. Five Forks Rd.
Monroe, VA 24574
cterrell@englanderstoves.com

Prepared by: Aaron Kravitz, Testing
Supervisor



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

WWW.PFSTECO.COM

Revision Summary

Date: June 2, 2020 – Original Issue

Date: April 29, 2021 – The following revisions were made per request from EPA:

- The notes section was edited to indicate that pre-test conditioning was performed at a medium combustion air setting, page 4.
- Appendix A was edited to correct an error in the test notes for Run 2. The test setting used was fully closed; an earlier version specified an air setting of 5/8" open, which was not used for any test, see page 110 of Non-CBI report.

Contents

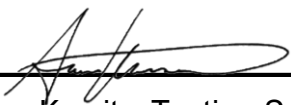
Affidavit	3
Introduction	4
Notes	4
Wood Heater Identification and Testing	5
Test Procedures and Equipment	6
Results	7
Summary Table	7
Test Run Narrative	8
Run 1	8
Run 2	8
Run 3	8
Test Conditions Summary	9
Appliance Operation and Test Settings	9
Settings & Run Notes	9
Appliance Description	10
Appliance Dimensions	10
Test Fuel Properties	13
Sampling Locations and Descriptions	14
Sample Points	14
Sampling Methods	15
Analytical Methods Description	15
Calibration, Quality Control and Assurances	15
Appliance Sealing and Storage	15
Sealing Label	15
Sealed Unit	16
Firebox Volume	17
List of Appendices	18

Affidavit

PFS-TECO was contracted by England's Stove Works, Inc. to provide testing services for the 15-W06 Wood-Fired Room Heater per ASTM E3053, *Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters Using Cordwood Test Fuel*, which was approved for use under EPA ALT-125. All testing and associated procedures were conducted at PFS beginning on 5/15/2020 and ending on 5/18/2020. PFS's testing facility is located at 11785 SE Hwy 212, Clackamas, OR 97015. Testing procedures followed ASTM E3053, with variances as described in EPA ALT-125. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel*, with the exception of caveats described in EPA ALT-125. A copy of EPA ALT-125 is included in Appendix A for reference, as required by the approval letter.

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

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



Aaron Kravitz, Testing Supervisor

Introduction

England's Stove Works, Inc. of Monroe, VA contracted with PFS-TECO to perform EPA certification testing on the model 15-W06 Wood-Fired Room Heater. All testing was performed at PFS-TECO's Portland, OR laboratory. All testing was performed by Aaron Kravitz.

Notes

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

Wood Heater Identification and Testing

- Appliance Tested: **15-W06**
- Serial Number: **Un-serialized Prototype – PFS Tracking Number 0071**
- Manufacturer: **England's Stove Works, Inc.**
- Catalyst: **No**
- Heat exchange blower: **Optional**
- Type: **Wood Stove**
- Style: **Free Standing**
- Date Received: **Thursday, April 16, 2020**
- Testing Period – Start: **Friday, May 15, 2020**
Finish: **Monday, May 18, 2020**
- Test Location: **PFS-TECO**
11785 SE Hwy 212 Clackamas, OR 97015
- Elevation: **~131 Feet above sea level**
- Test Technician(s): **Aaron Kravitz**
- Observers: **None**

Test Procedures and Equipment

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

Equipment List:

Equipment ID#	Equipment Description
041	Rice Lake 3'x3' floor scale w/digital weight indicator
132	Digiweigh DWP-440 Platform Scale
53	APEX XC-60-ED Digital Emissions Sampling Box A
54	APEX XC-60-ED Digital Emissions Sampling Box B
57	California Analytical ZRE CO ₂ /CO/O ₂ IR ANALYZER
064	Digital Barometer
109A/B	Troemner 100mg/200mg Audit Weights
107	Sartorius Analytical Balance
051	10 lb audit weight
101	Dewalt Tape Measure
117	Digital Calipers
095	Anemometer
111	Microtector
115	Delmhorst Wood Moisture Meter
SA17187	Gas Analyzer Calibration Span Gas
CC170624	Gas Analyzer Calibration Mid Gas

Results

The weighted average emissions rate for the 3 run test series was measured to be **1.8 g/hr** with a Higher Heating Value efficiency of **72%**. The average CO emission rate for the 3 tests was **1.9 g/min**. The England's Stove Works, Inc. model 15-W06 Wood-Fired Room Heater meets the 2020 cordwood PM emission standard of ≤ 2.5 g/hr per CFR 40 part 60, §60.532 (c).

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

Summary Table

	High Fire Test	Low Fire Test	Medium Fire Test
Date	5/15/2020	5/15/2020	5/18/2020
Run Number	1	2	3
PM Emission Rate (g/hr)	3.62	1.02	1.63
Burn Rate (kg/hr)	5.03	1.19	1.38
Heat Output (BTU/hr)	65,853	17,521	18,440
HHV Efficiency (%)	70.8%	73.2%	72.0%
LHV Efficiency (%)	75.8%	78.3%	77.1%
CO Emissions (g/MJ output)	2.09	5.45	4.70
CO Emissions (g/kg dry fuel)	29.62	79.67	67.60
CO Emissions (g/min)	2.42	1.68	1.52
1 st Hour Emission Rate (g/hr)	4.61	7.84	8.95
Weighting Factor (%)	20%	40%	40%
Weighted particulate emission average of 3 test runs: 1.8 grams per hour.			
Weighted average HHV efficiency of 3 test runs: 72%.			
Average CO emission rate for 3 test runs: 1.9 grams per minute			

Test Run Narrative

Run 1

Run 1 was performed on 5/15/2020 as a high fire test run per ASTM E3053. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 37 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. Total test time was 144 minutes, main test fuel load burn time was 107 min. The particulate emissions rate from kindling ignition to test completion was 3.62 g/hr. The burn rate of the test fuel load was 5.03 kg/hr. The main test load portion of the run had an overall HHV efficiency of 70.8%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 2

Run 2 was performed on 5/15/2020 as a low fire test run per ASTM E3053. The overall test duration was 635 minutes. The burn rate for the test run was 1.19 kg/hr. This run qualifies as a low burn because its duration exceeded 8 hours. The particulate emissions rate for the test run was 1.02 g/hr. The run had an overall HHV efficiency of 73.2%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 3

Run 3 was performed on 5/18/2020 as a medium fire test run per ASTM E3053. The overall test duration was 544 minutes. The burn rate for the test run was 1.38 kg/hr, therefore the medium fire category requirements were met, less than the mid-point of the high and low burn rates (3.11 kg/hr). The particulate emissions rate for the test run was 1.63 g/hr. The run had an overall HHV efficiency of 72.0%. The train A front filter was changed at 1 hr. There were no anomalies and all criteria were met.

Test Conditions Summary

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

Runs	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	72	77	54	38	30.03	11.49	27.25	21.3%	144
2	78	72	38	47	30.10	27.25	33.44	20.1%	635
3	74	71	27	39	29.93	27.6	33.81	22.2%	544

Appliance Operation and Test Settings

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

Settings & Run Notes

	Pre-Burn Air Setting	Test Run Air and Fan Settings
Run 1	N/A – Cold Start Ignition	Air control set to high fire test setting (maximum). Fan off until main test fuel loaded, then set to high.
Run 2	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to maximum for first 15 minutes, then set to minimum. Fan off for first 15 minutes, then set to low.
Run 3	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to maximum for first 15 minutes, then set to medium (1" open). Fan off for first 15 minutes, then set to low.

Appliance Description

Model(s): 15-W06

Additional Models Discussion: In addition to the tested model, this design is also offered under other model names by the manufacturer. The 50-SHW06, 50-SHW06L, and 50TRW06 models differ only in branding designations. The 15-W08, 50-SHW08, 50-SHW08L, and 50TRW08 are other branding variants that also feature a decorative laser cutout panel in front of the door glass. All models utilize the same basic design with respect to performance and emission controls and are presumed to have the same emissions performance.

Appliance Type: Wood-Fired Room Heater

Firebox Volume: 2.86 ft³

Air Introduction System: Primary Air enters the firebox from the upper rear of the appliance and is channeled above the firebox via a centrally-located passage to the air wash. Primary air is controlled via a damper arm located at the rear/right side of the unit which moves in (closed) and out (open). Secondary air is pulled through a fixed opening at the bottom of the firebox and channeled under the stove and up through 4 secondary air tubes. Dimensions on all these features can be found in Appendix D.

Baffles: A 20" x 19" x 1" vermiculite baffle is rests on top of the secondary air tubes. It consists of four individual panels.

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

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

Catalytic Combustor: N/A

Fan: Optional rear-mounted, two-speed convection blower.

Appliance Dimensions

15-W06 Unit Dimensions

Height	Width	Depth	Firebox Volume
34"	23"	27"	2.86 ft ³

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

Appliance Front



Appliance Left



Appliance Right



Appliance Rear



Test Fuel Properties

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

Typical Kindling Load



Typical Startup Load



Typical High Fire Load



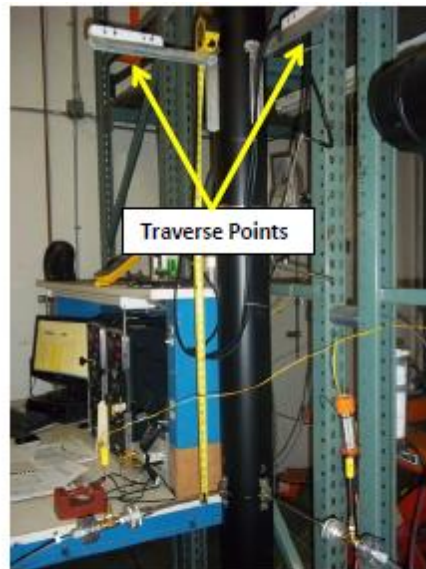
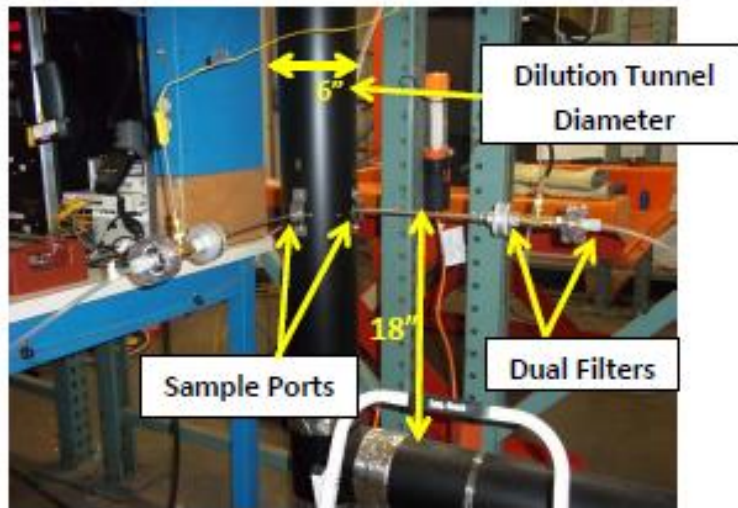
Typical Low Fire Load



Sampling Locations and Descriptions

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

Sample Points



Sampling Methods

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

Analytical Methods Description

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

Calibration, Quality Control and Assurances

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

Appliance Sealing and Storage

Upon completion of testing, the appliance was secured with metal strapping and the seal below was applied, the appliance was then returned to the manufacturer's location at: 589 S. Five Forks Rd. , Monroe, VA 24574 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



Firebox Volume

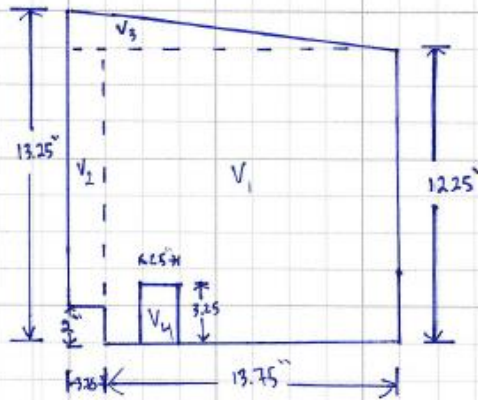


An Employee-Owned Company • PFS Corporation d/b/a PFS TECO

PROJECT: 20-601

DATE: 5/15/2020

ESW 15-W06 Firebox Volume



FB width = 23"
Pilot Box (V₄) width = 2"

$$\text{Total Volume} = V_1 + V_2 + V_3 - V_4$$

$$V_1 = 13.75'' \times 12.25'' \times 23'' = 3874 \text{ in}^3$$

$$V_2 = 10.25'' \times 3.75'' \times 23'' = 884 \text{ in}^3$$

$$V_3 = \frac{1}{2} [1'' \times 17.5'' \times 23''] = 201 \text{ in}^3$$

$$V_4 = 3.25'' \times 2.5'' \times 2'' = 16 \text{ in}^3$$

$$\Rightarrow 3874 + 884 + 201 - 16 = \underline{\underline{4943}} \text{ in}^3 \Rightarrow \boxed{2.86 \text{ ft}^3}$$

List of Appendices

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

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

Appendix B – Labels and Manuals

Appendix C – Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

Conditioning Data

Client: Englander	Job #: 20-601
Model: 15-W06	Tracking #: 71
Date(s): 5/11/20 - 5/15/20	Technician: AK

Elapsed Time (hrs)	Scale Reading (lbs)	Weight Change (lbs)	Average:	261.6	77.0	Catalyst Exit (°F)
				Flue (°F)	Ambient (°F)	
0	14.7	-		392	74	
1	10.7	-4.0		366	79	
2	6.3	-4.4		409	80	
3	2.5	-3.8		359	81	
4	0.9	-1.6		324	80	
5	0.1	-0.8		310	79	
6	19.1	19.0		474	80	
7	11.6	-7.5		442	81	
8	6.8	-4.8		334	81	
9	5.7	-1.1		226	79	
10	4.9	-0.8		211	78	
11	4.1	-0.8		203	78	
12	3.6	-0.5		196	77	
13	3.0	-0.6		190	77	
14	2.4	-0.6		186	76	
15	1.9	-0.5		183	75	
16	1.4	-0.5		180	75	
17	0.9	-0.5		175	74	
18	0.4	-0.5		170	73	
19	17.9	17.5		245	74	
20	11.6	-6.3		422	75	
21	7.8	-3.8		275	76	
22	5.5	-2.3		195	76	
23	3.8	-1.7		197	77	
24	3.1	-0.7		179	77	
25	2.4	-0.7		183	78	
26	1.7	-0.7		174	77	
27	1.3	-0.4		170	77	
28	0.7	-0.6		167	76	
29	0.2	-0.5		162	76	
30	11.2	11.0		310	80	
31	5.9	-5.3		370	80	
32	3.7	-2.2		306	80	
33	2.8	-0.9		256	80	
34	2.0	-0.8		214	80	
35	1.2	-0.8		199	80	
36	0.5	-0.7		197	80	
37	33.8	33.3		190	80	
38	23.6	-10.2		478	75	
39	17.4	-6.2		411	76	
40	12.1	-5.3		417	75	
41	8.4	-3.7		370	75	
42	6.8	-1.6		298	74	
43	5.9	-0.9		222	73	
44	5.2	-0.7		211	71	
45	4.5	-0.7		208	74	
46	3.8	-0.7		204	76	
47	3.2	-0.6		198	76	
48	2.6	-0.6		195	76	
49	2.0	-0.6		192	75	
50	1.2	-0.8		196	75	

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 - ft³
Catalytic/Non-Cat
Convection Air Fan (No, Standard, Optional)

15-W06
England's Stove Works

Free-standing
2.86
Non-Cat
Optional

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

ASTM E3053 (ALT-125), ASTM E2515
6.00
47
Pall Type TX40

SECTION 2 – Test Conditions Summary

Test Run #
 Date Tested
 Test Run Category (L, M, H)
 Average Barometric Pressure - in Hg
 Max. Observed Ambient Temp - °F
 Min. Observed Ambient Temp - °F
 Max. Observed Filter Temp - °F
 Test Fuel Load
 Cordwood Fuel Species
 Specific Gravity (from Table 1)
 Higher Heating Value - Btu/lb (from Annex A1)
 Nom. Test Fuel Load Piece Length - in.
 Number of Test Fuel Pieces
 Test Fuel Weight
 Kindling - As Fired lb
 Kindling Wt. - As % of Test Fuel Load
 Kindling Moisture - % DB
 Kindling - kg DB
 SU Fuel - As Fired lb
 SU Fuel Wt. - As % of Test Fuel Load
 SU Fuel Moisture - % DB
 SU Fuel - kg DB
 Test Fuel Load - As Fired lb
 Ave. Test Fuel Load MC % DB
 Test Fuel Load - kg DB
 Test Fuel Loading Density - lb/ft³
 Residual SU Fuel Wt. - As Fired lb
 Residual SU Fuel Wt. - As % of Test Fuel Load
 Test Run Duration - minutes
 Test Run Duration - h
 Run Duration of High Fire Load Only - minutes
 Run Duration of High Fire Load Only - h
 Test Fuel Load Wt. at End of Test - As Fired lb
 Total Fuel Burned - kg DB
 % Test Fuel Load Wt. at End of Test

	1	2	3
Test Run #	1	2	3
Date Tested	5/15/2020	5/15/2020	5/18/2020
Test Run Category (L, M, H)	High Fire	Low Fire	Low Fire
Average Barometric Pressure - in Hg	30.03	30.10	29.93
Max. Observed Ambient Temp - °F	79	79	76
Min. Observed Ambient Temp - °F	72	71	71
Max. Observed Filter Temp - °F	88	86	87
Test Fuel Load			
Cordwood Fuel Species	Maple, Hard	Maple, Hard	Maple, Hard
Specific Gravity (from Table 1)	0.6	0.6	0.6
Higher Heating Value - Btu/lb (from Annex A1)	8587	8587	8587
Nom. Test Fuel Load Piece Length - in.	0	0	0
Number of Test Fuel Pieces	5	6	6
Test Fuel Weight			
Kindling - As Fired lb	4.86	N/A	N/A
Kindling Wt. - As % of Test Fuel Load	18%	N/A	N/A
Kindling Moisture - % DB	10%	N/A	N/A
Kindling - kg DB	2.00	N/A	N/A
SU Fuel - As Fired lb	6.63	N/A	N/A
SU Fuel Wt. - As % of Test Fuel Load	24%	N/A	N/A
SU Fuel Moisture - % DB	21%	N/A	N/A
SU Fuel - kg DB	2.48	N/A	N/A
Test Fuel Load - As Fired lb	27.25	33.44	33.81
Ave. Test Fuel Load MC % DB	21.3%	20.1%	22.2%
Test Fuel Load - kg DB	10.19	12.63	12.55
Test Fuel Loading Density - lb/ft ³	9.60	11.77	11.90
Residual SU Fuel Wt. - As Fired lb	3.40	N/A	N/A
Residual SU Fuel Wt. - As % of Test Fuel Load	12%	N/A	N/A
Test Run Duration - minutes	144	635	544
Test Run Duration - h	2.40	10.58	9.07
Run Duration of High Fire Load Only - minutes	107	N/A	N/A
Run Duration of High Fire Load Only - h	1.78	N/A	N/A
Test Fuel Load Wt. at End of Test - As Fired lb	2.7	0	0
Total Fuel Burned - kg DB	11.91	12.63	12.55
% Test Fuel Load Wt. at End of Test	9.9%	0.0%	0.0%

SECTION 3 – Test Run Results Summary

Test Run #	1	2	3
Date Tested	5/15/20	5/15/20	5/18/20
Test Run Category	High Fire	Low Fire	Low Fire
Burn Rate - kg/h DB	5.03	1.19	1.38
Heat Output - Btu/h	65,853	17,521	18,440
Average Dilution Tunnel Flow Rate - dscfm	176.12	183.20	181.12
Average Sample Flow Rates - dscfm			
Train 1	0.128	0.131	0.132
Train 2	0.128	0.126	0.124
Total PM Emissions - g			
Train 1	8.85	11.61	14.14
Train 2	8.51	10.08	15.41
Average	8.681	10.847	14.778
PM Emission Train Precision - %	1.9%	7.0%	4.3%
PM Emission Train Precision - g/kg	0.01	0.06	0.05
PM Emission Rate - g/h	3.62	1.02	1.63
Total CO Emissions - g	259	1006	829
CO Emissions Rate - g/h	145	101	91
Overall Efficiency - CSA B415.1-10			
% HHV Basis	71%	73%	72%
% LHV Basis	76%	78%	77%

1	2	3	
5/15/20	5/15/20	5/18/20	
High Fire	Low Fire	Low Fire	
5.03	1.19	1.38	
65,853	17,521	18,440	
176.12	183.20	181.12	
0.128	0.131	0.132	
0.128	0.126	0.124	
8.85	11.61	14.14	
8.51	10.08	15.41	
8.681	10.847	14.778	
1.9%	7.0%	4.3%	
0.01	0.06	0.05	
3.62	1.02	1.63	
259	1006	829	
145	101	91	
71%	73%	72%	
76%	78%	77%	

SECTION 4 - Weighted Average Summary

Test Run Category	High Fire	Low Fire	Low Fire
Burn Rate - kg/h DB	5.03	1.19	1.38
PM Emission Rate - g/h	3.62	1.02	1.63
CO Emissions Rate - g/h	145.4	100.7	91.4
Overall Efficiency - CSA B415.1-10			
% HHV Basis	71%	73%	72%
% LHV Basis	76%	78%	77%
Heat Output - Btu/h	65900	17500	18400
Category Weighting	20%	40%	40%

High Fire	Low Fire	Low Fire
5.03	1.19	1.38
3.62	1.02	1.63
145.4	100.7	91.4
71%	73%	72%
76%	78%	77%
65900	17500	18400
20%	40%	40%

ASTM E 3053 Weighted Averages

PM Emission Rate - g/h	1.8
CO Emissions Rate - g/h (Arithmetic Average)	112.5
CO Emissions Rate - g/min (Arithmetic Average)	1.9
Overall Efficiency - CSA B415.1-10	
% HHV Basis	72%
% LHV Basis	77%
Heat Output Range - Btu/h	17500 to 65900

1.8
112.5
1.9
72%
77%
17500 to 65900

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515



Run 1 Data Summary

Client: England's Stove Works
Model: 15-W06
Job #: 20-601
Tracking #: 0071
Test Date: 5/15/2020

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

Techician Signature

6/2/2020

Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: England's Stove WorksModel: 15-W06Run #: 1Job #: 20-601Tracking #: 0071Technician: AKDate: 5/15/2020

Burn Rate (kg/hr):	5.03
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	0.000	18.501	18.411	7.640
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.27			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	10567.4			
Average Gas Meter Temperature (°F)	75.7	91.5	92.3	83.6
Total Sample Volume (dscf)	0.000	18.058	17.873	7.565
Average Tunnel Temperature (°F)	139.5			
Total Time of Test (min)	144			
Total Particulate Catch (mg)	0.0	6.3	6.0	3.3
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0003489	0.0003357	0.0004362
Total PM Emissions (g)	0.00	8.85	8.51	4.61
Particulate Emission Rate (g/hr)	0.00	3.69	3.55	4.61
Emissions Factor (g/kg)	-	0.74	0.71	-
Difference from Average Total Particulate Emissions (g)	-	0.17	0.17	-
Difference from Average Emissions Factor (g/kg)	-	0.01	0.01	-

Final Average Results	
Total Particulate Emissions (g)	8.68
Particulate Emission Rate (g/hr)	3.62
Emissions Factor (g/kg)	0.73
HHV Efficiency (%)	70.8%
LHV Efficiency (%)	75.8%
CO Emissions (g/min)	2.42

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 84 / Max: 88	OK
Face Velocity	< 30 ft/min	7.4	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min: 72 / Max: 79	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	CHECK 10 MIN. INTERVAL PRO-RATES

B415.1 Efficiency Results

Manufacturer: Island's Stove Works
Model: 15-W06
Date: 05/15/20
Run: 1
Control #: 20-601
Test Duration: 107
Output Category: High

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	70.8%	75.8%
Combustion Efficiency	98.1%	98.1%
Heat Transfer Efficiency	72.2%	77.3%

Output Rate (kJ/h)	69,421	65,853	(Btu/h)
Burn Rate (kg/h)	4.91	10.82	(lb/h)
Input (kJ/h)	98,001	92,964	(Btu/h)

Test Load Weight (dry kg)	8.76	19.30	dry lb
MC wet (%)	17.53		
MC dry (%)	21.26		
Particulate (g)	8.68		
CO (g)	259		
Test Duration (h)	1.78		

Emissions	Particulate	CO
g/MJ Output	0.07	2.09
g/kg Dry Fuel	0.99	29.62
g/h	4.87	145.42
g/min	0.08	2.42
lb/MM Btu Output	0.16	4.87

Air/Fuel Ratio (A/F)	10.70
-----------------------------	-------

VERSION:

2.2

12/14/2009

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking # 0071
 Technician: AK
 Date: 5/15/2020

Nominal Loading Density (lbs/ft³, wet basis): 10
 Usable Firebox Volume (ft³): 2.86
 Target Load Weight (lbs): **28.60**
 Total Load Weight Range (lbs): **27.20** to **30.00**
 Core Load Weight Range (lbs): 12.90 to 18.60
 Remainder Load Weight Range (lbs): 10.00 to 15.70
 Core Load Piece Range (lbs): **4.30** to **7.20**
 Remainder Load Piece Range (lbs): **2.90** to **15.70**
 Max Allowable Kindling Weight (lbs): 5.45
 Max Allowable Start-up Fuel Weight (lbs): 8.18

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		5.49	In Range	20.4	21.9	23.0	21.8	In Range	4.51	2.05	
2		4.84	In Range	19.4	28.9	19.6	22.6	In Range	3.95	1.79	
3		5.63	In Range	19.1	28.0	19.5	22.2	In Range	4.61	2.09	
Core Load Wt. (lbs)		15.96	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		4.36	In Range	22.4	19.2	20.1	20.6	In Range	3.62	1.64	
2		6.93	In Range	18.0	21.3	19.5	19.6	In Range	5.79	2.63	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		11.29	In Range								

Total Load Weight (lbs): **27.25** 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: 95% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 9.5
 Total Load Average Moisture Content (%DB): **21.3** In Range 19-25%
 Total Load Average Moisture Content (%WB): 17.5
 Total Test Load Weight (dry basis): 22.47 lbs 10.19 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
4.86	In Range	10	10	10	10.0	In Range	4.42	2.00

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
6.63	In Range	19.5	22.6	21.8	21.3	In Range	5.47	2.48

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): **2.7** to **5.5**
 Actual Residual Start-up Fuel Weight (lb): **3.4** In Range

TEST END POINT

High Fire Test Run End Point Range: **2.5** to **3.0** lb
 Actual Fuel Load Ending Weight (lb): **2.7** In Range

Total Weight All Fuel Added: 38.74 lbs, wet basis Total Weight All Fuel Burned (dry basis): 26.26 lbs
 32.36 lbs, dry basis 11.91 kg
 14.68 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: England's Stove Works

Model: 15-W06

Run #: 1

Test Start Time: 11:20

Test Type: High Fire

Job #: 20-601

Tracking #: 0071

Technician: AK

Date: 5/15/2020

Recording Interval (min): 1

Total Sampling Time (min): 144

High Fire Test Load Time (min): 37

Meter Box γ Factor: 1.012 (A)Meter Box γ Factor: 1.008 (B)Meter Box γ Factor: (Ambient)Induced Draft Check (in. H₂O): 0

Smoke Capture Check (%): 100%

Date Flue Pipe Last Cleaned: 5/14/2020

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.04	30.02	30.03
Relative Humidity (%)	54.0	38.0	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:			ft ³

Sample Train Post-Test Leak Checks

(A) 0.000 cfm @ -5 in. Hg

(B) 0.001 cfm @ -10 in. Hg

(Ambient) cfm @ in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.038	74
2	0.072	74
3	0.074	74
4	0.066	74
5	0.026	74
6	0.076	74
7	0.076	74
8	0.038	74
Center	0.080	74

Dilution Tunnel H₂O: 2.00 percent

Tunnel Diameter: 6 inches

Pitot Tube Cp: 0.99 [unitless]

Dilution Tunnel MW(dry): 29.00 lb/lb-mole

Dilution Tunnel MW(wet): 28.78 lb/lb-mole

Tunnel Area: 0.1963 ft²V_{strav}: 16.13 ft/secV_{scnt}: 18.82 ft/secF_p: 0.857 [ratio]

Initial Tunnel Flow: 181.0 scf/min

Static Pressure: -0.200 in. H₂O

TEST FUEL PROPERTIES

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

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

WOODSTOVE PREBURN DATA

Client: England's Stove Worl

Model: 15-W06

Run #: 1

Job #: 20-601

Tracking #: 0071

Technician: AK

Date: 5/15/2020

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

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.075	0.00	77	-0.04		11.4		75	75	86	72
1	0.088	0.088	0.077	1.69	77	-0.84	69	11.3	-0.1	82	137	84	72
2	0.214	0.126	0.085	1.64	77	-0.89	94	11.0	-0.3	89	285	84	72
3	0.338	0.124	0.086	1.68	77	-0.74	93	10.7	-0.3	98	390	85	72
4	0.464	0.126	0.082	1.67	77	-0.96	97	10.5	-0.2	103	430	85	72
5	0.592	0.128	0.089	1.67	77	-0.57	95	10.3	-0.2	104	432	85	72
6	0.716	0.124	0.082	1.67	78	-0.76	96	10.1	-0.2	107	445	86	72
7	0.842	0.126	0.085	1.69	78	-0.75	96	9.9	-0.2	109	463	86	72
8	0.971	0.129	0.082	1.66	78	-0.86	100	9.6	-0.3	112	477	86	72
9	1.096	0.125	0.085	1.68	78	-0.66	96	9.2	-0.4	115	490	86	73
10	1.220	0.124	0.087	1.66	78	-0.87	94	9.2	0	118	508	86	73
11	1.347	0.127	0.089	1.68	78	-0.77	95	8.9	-0.3	120	519	86	73
12	1.476	0.129	0.084	1.71	78	-0.76	100	8.5	-0.4	123	530	86	73
13	1.601	0.125	0.079	1.70	79	-0.96	100	8.3	-0.2	124	538	86	73
14	1.729	0.128	0.078	1.69	79	-0.52	103	8.1	-0.2	127	551	86	73
15	1.857	0.128	0.081	1.72	79	-0.67	101	7.8	-0.3	129	561	86	73
16	1.983	0.126	0.082	1.70	79	-0.71	99	7.4	-0.4	130	566	86	73
17	2.108	0.125	0.075	1.70	80	-0.7	103	7.3	-0.1	132	567	86	73
18	2.238	0.130	0.079	1.71	80	-0.64	104	7.0	-0.3	132	560	85	74
19	2.366	0.128	0.087	1.71	80	-0.5	98	6.6	-0.4	132	555	85	73
20	2.491	0.125	0.075	1.70	81	-0.66	103	6.5	-0.1	132	550	85	74
21	2.620	0.129	0.086	1.71	81	-0.64	99	6.3	-0.2	131	544	85	74
22	2.751	0.131	0.083	1.72	81	-0.87	102	6.1	-0.2	132	542	85	73
23	2.878	0.127	0.085	1.74	81	-0.73	98	5.9	-0.2	132	541	85	74
24	3.006	0.128	0.087	1.73	82	-1.02	98	5.7	-0.2	132	543	85	73
25	3.137	0.131	0.081	1.72	82	-0.72	104	5.4	-0.3	133	549	85	74
26	3.264	0.127	0.083	1.72	82	-1.13	99	5.2	-0.2	133	554	85	74
27	3.392	0.128	0.078	1.76	83	-0.64	103	5.0	-0.2	133	549	85	74
28	3.524	0.132	0.084	1.73	83	-1.15	102	4.8	-0.2	133	543	85	74
29	3.652	0.128	0.084	1.73	83	-0.75	99	4.5	-0.3	133	539	85	74
30	3.781	0.129	0.079	1.76	84	-1	103	4.4	-0.1	133	538	85	74
31	3.913	0.132	0.074	1.75	84	-0.76	109	4.2	-0.2	132	534	85	74
32	4.041	0.128	0.083	1.76	84	-0.93	99	4.0	-0.2	132	529	85	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.171	0.130	0.077	1.74	85	-0.62	105	3.8	-0.2	131	521	85	74
34	4.303	0.132	0.077	1.76	85	-0.67	106	3.7	-0.1	131	518	85	74
35	4.432	0.129	0.082	1.76	85	-0.72	101	3.5	-0.2	130	514	85	74
36	4.562	0.130	0.077	1.79	85	-0.81	104	3.4	-0.1	129	507	85	74
37	4.692	0.130	0.088	1.69	86	-0.77	100	29.6	26.2	158	555	86	74
38	4.819	0.127	0.075	1.72	86	-0.9	104	29.4	-0.2	141	521	86	74
39	4.948	0.129	0.090	1.73	86	-0.89	96	29.1	-0.3	137	518	86	74
40	5.079	0.131	0.076	1.68	87	-1	106	28.9	-0.2	136	528	86	74
41	5.204	0.125	0.085	1.61	87	-1.08	96	28.6	-0.3	137	549	86	74
42	5.328	0.124	0.076	1.61	87	-1.18	101	28.3	-0.3	137	548	86	74
43	5.454	0.126	0.077	1.61	87	-0.82	102	28.1	-0.2	137	547	86	74
44	5.582	0.128	0.082	1.59	88	-0.98	100	27.8	-0.3	137	552	86	74
45	5.704	0.122	0.081	1.60	88	-1.14	96	27.6	-0.2	138	562	86	74
46	5.827	0.123	0.086	1.57	88	-0.88	94	27.3	-0.3	140	568	86	75
47	5.953	0.126	0.081	1.59	88	-1	99	27.0	-0.3	141	573	86	75
48	6.077	0.124	0.075	1.57	89	-1.22	101	26.8	-0.2	141	573	86	75
49	6.203	0.126	0.081	1.77	89	-1.19	99	26.4	-0.4	142	578	86	75
50	6.334	0.131	0.087	1.73	89	-1.19	99	26.2	-0.2	142	579	86	75
51	6.467	0.133	0.087	1.75	89	-1.24	101	25.9	-0.3	142	581	86	75
52	6.594	0.127	0.094	1.77	89	-1.06	93	25.6	-0.3	143	582	86	76
53	6.725	0.131	0.076	1.73	90	-1.15	106	25.4	-0.2	143	585	86	76
54	6.857	0.132	0.082	1.75	90	-1.13	103	25.1	-0.3	144	588	86	75
55	6.985	0.128	0.093	1.73	90	-1.11	94	24.8	-0.3	144	589	86	76
56	7.116	0.131	0.074	1.72	90	-1.14	108	24.5	-0.3	145	591	87	76
57	7.248	0.132	0.083	1.73	91	-1.45	102	24.3	-0.2	145	592	86	76
58	7.375	0.127	0.085	1.73	91	-1.35	97	24.0	-0.3	145	593	86	76
59	7.506	0.131	0.085	1.73	91	-1.04	101	23.7	-0.3	146	592	86	77
60	7.640	0.134	0.086	1.90	91	-0.9	102	23.5	-0.2	146	594	85	76
61	7.774	0.134	0.080	1.68	91	-0.84	106	23.2	-0.3	146	595	85	76
62	7.906	0.132	0.084	1.69	92	-0.7	102	22.9	-0.3	146	596	86	76
63	8.035	0.129	0.086	1.69	92	-0.53	98	22.6	-0.3	147	597	86	76
64	8.161	0.126	0.078	1.68	92	-0.5	101	22.3	-0.3	147	598	86	77
65	8.290	0.129	0.077	1.67	92	-0.57	104	22.1	-0.2	147	600	86	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	8.421	0.131	0.084	1.67	92	-0.44	101	21.8	-0.3	148	604	87	76
67	8.547	0.126	0.074	1.72	93	-0.47	103	21.5	-0.3	148	608	87	76
68	8.676	0.129	0.084	1.67	93	-0.64	99	21.2	-0.3	148	610	87	77
69	8.807	0.131	0.079	1.67	93	-0.6	104	20.8	-0.4	149	612	87	76
70	8.934	0.127	0.088	1.67	93	-0.8	96	20.6	-0.2	149	613	87	77
71	9.062	0.128	0.079	1.67	93	-0.52	102	20.3	-0.3	151	615	87	77
72	9.193	0.131	0.076	1.70	94	-0.5	106	20.0	-0.3	151	618	87	77
73	9.321	0.128	0.077	1.70	94	-0.84	103	19.7	-0.3	151	620	87	77
74	9.449	0.128	0.085	1.69	94	-0.62	98	19.4	-0.3	152	622	87	77
75	9.579	0.130	0.074	1.68	94	-0.84	107	19.1	-0.3	151	624	87	77
76	9.706	0.127	0.079	1.68	94	-0.68	101	18.8	-0.3	151	624	87	77
77	9.834	0.128	0.077	1.67	94	-0.71	103	18.5	-0.3	152	625	87	77
78	9.966	0.132	0.077	1.71	95	-0.74	106	18.2	-0.3	152	625	87	78
79	10.094	0.128	0.080	1.74	95	-0.62	101	17.9	-0.3	151	625	87	77
80	10.224	0.130	0.086	1.73	95	-0.74	99	17.6	-0.3	153	625	87	77
81	10.357	0.133	0.077	1.72	95	-0.94	107	17.2	-0.4	153	625	87	78
82	10.485	0.128	0.087	1.71	95	-0.41	97	17.1	-0.1	152	626	87	77
83	10.614	0.129	0.081	1.70	95	-0.89	101	16.7	-0.4	153	626	87	77
84	10.747	0.133	0.081	1.70	95	-1.03	104	16.5	-0.2	154	627	87	78
85	10.874	0.127	0.078	1.69	96	-0.72	101	16.2	-0.3	154	628	87	78
86	11.001	0.127	0.078	1.66	96	-0.87	101	15.8	-0.4	153	628	87	78
87	11.133	0.132	0.079	1.65	96	-0.84	105	15.5	-0.3	154	629	87	78
88	11.261	0.128	0.085	1.73	96	-0.61	98	15.4	-0.1	154	628	87	77
89	11.387	0.126	0.080	1.68	96	-0.87	99	15.1	-0.3	154	628	87	77
90	11.519	0.132	0.079	1.68	96	-0.7	105	14.8	-0.3	154	628	87	78
91	11.649	0.130	0.084	1.64	96	-0.91	100	14.6	-0.2	153	627	87	78
92	11.774	0.125	0.075	1.66	96	-0.99	102	14.3	-0.3	153	628	87	78
93	11.902	0.128	0.078	1.64	97	-0.94	102	14.0	-0.3	153	626	87	78
94	12.033	0.131	0.082	1.68	97	-1.15	102	13.7	-0.3	153	627	87	78
95	12.160	0.127	0.079	1.69	97	-1	101	13.4	-0.3	153	628	87	79
96	12.288	0.128	0.076	1.67	97	-1.06	104	13.1	-0.3	156	652	87	78
97	12.418	0.130	0.083	1.65	97	-0.81	101	12.8	-0.3	159	663	88	78
98	12.545	0.127	0.079	1.65	97	-0.89	101	12.6	-0.2	160	662	88	79

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	12.673	0.128	0.085	1.71	97	-0.94	98	12.3	-0.3	161	658	88	78
100	12.804	0.131	0.074	1.68	97	-1.02	108	12.0	-0.3	160	653	88	78
101	12.932	0.128	0.084	1.69	97	-0.86	99	11.8	-0.2	159	650	88	78
102	13.062	0.130	0.083	1.69	98	-1.17	101	11.4	-0.4	160	648	88	79
103	13.193	0.131	0.077	1.69	98	-1.03	105	11.3	-0.1	160	647	88	79
104	13.321	0.128	0.086	1.65	98	-1.13	98	11.0	-0.3	160	643	88	78
105	13.450	0.129	0.079	1.70	98	-0.9	103	10.8	-0.2	160	640	88	78
106	13.582	0.132	0.095	1.70	98	-0.91	96	10.6	-0.2	160	636	88	77
107	13.709	0.127	0.081	1.68	98	-1.07	100	10.2	-0.4	159	631	88	77
108	13.837	0.128	0.076	1.67	98	-0.97	104	9.9	-0.3	158	625	87	77
109	13.969	0.132	0.077	1.63	98	-0.88	106	9.8	-0.1	158	622	87	77
110	14.097	0.128	0.091	1.66	98	-1.1	95	9.6	-0.2	158	621	87	76
111	14.224	0.127	0.084	1.69	99	-1	97	9.4	-0.2	156	600	87	76
112	14.356	0.132	0.089	1.67	99	-0.97	98	9.0	-0.4	153	587	87	76
113	14.486	0.130	0.091	1.68	99	-0.89	95	9.0	0	151	577	87	76
114	14.612	0.126	0.086	1.63	99	-1.08	95	8.8	-0.2	150	567	87	76
115	14.744	0.132	0.091	1.64	99	-0.95	97	8.7	-0.1	149	559	87	77
116	14.874	0.130	0.078	1.67	99	-0.96	103	8.6	-0.1	148	551	87	76
117	15.000	0.126	0.087	1.65	99	-1.01	94	8.4	-0.2	147	544	87	76
118	15.131	0.131	0.079	1.66	99	-1.06	103	8.2	-0.2	145	537	87	77
119	15.262	0.131	0.081	1.65	99	-1.34	101	8.2	0	144	531	87	76
120	15.389	0.127	0.081	1.67	99	-0.9	98	8.0	-0.2	142	524	87	76
121	15.518	0.129	0.085	1.68	99	-0.9	97	7.9	-0.1	140	517	87	77
122	15.651	0.133	0.087	1.67	100	-1.08	99	7.7	-0.2	140	513	87	77
123	15.778	0.127	0.083	1.68	100	-1.02	96	7.7	0	138	507	86	76
124	15.907	0.129	0.075	1.68	100	-1.18	103	7.6	-0.1	138	503	86	77
125	16.039	0.132	0.083	1.69	100	-1.02	100	7.5	-0.1	138	499	86	77
126	16.167	0.128	0.078	1.64	100	-1.1	100	7.4	-0.1	137	495	86	76
127	16.295	0.128	0.083	1.67	100	-1.03	97	7.3	-0.1	136	492	86	77
128	16.427	0.132	0.091	1.70	100	-1.12	95	7.2	-0.1	135	490	86	77
129	16.556	0.129	0.079	1.65	100	-1.07	100	7.1	-0.1	133	485	86	77
130	16.684	0.128	0.085	1.67	100	-0.88	96	7.0	-0.1	132	479	86	77
131	16.815	0.131	0.074	1.65	100	-1.28	105	7.1	0.1	132	475	86	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	16.944	0.129	0.077	1.69	100	-1.1	101	6.9	-0.2	132	470	86	77
133	17.073	0.129	0.086	1.65	100	-1.07	96	6.7	-0.2	131	466	86	77
134	17.204	0.131	0.075	1.62	100	-0.8	104	6.8	0.1	130	464	86	77
135	17.333	0.129	0.068	1.62	100	-0.77	107	6.7	-0.1	130	460	86	77
136	17.463	0.130	0.079	1.67	100	-1.01	100	6.6	-0.1	129	454	86	77
137	17.594	0.131	0.088	1.66	100	-1.3	96	6.6	0	128	449	86	77
138	17.722	0.128	0.080	1.68	101	-1.01	98	6.5	-0.1	127	445	86	76
139	17.852	0.130	0.085	1.67	101	-1	96	6.4	-0.1	127	442	86	77
140	17.983	0.131	0.081	1.68	101	-1.15	99	6.4	0	126	440	86	77
141	18.112	0.129	0.081	1.67	101	-1.16	98	6.4	0	126	437	86	76
142	18.241	0.129	0.087	1.70	101	-1.1	94	6.3	-0.1	125	434	86	77
143	18.373	0.132	0.081	1.69	101	-1.02	100	6.2	-0.1	125	431	86	77
144	18.501	0.128	0.079	1.64	101	-0.97	98	6.2	0	124	429	86	77
Avg/Tot	18.501	0.128	0.082	1.68	91	-0.89	100			140	552	86	75.7

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	0.000		0.00	77	-1		86	0.000	0.16	0.00
1	0.082	0.082	1.68	77	-3.08	65	85	-0.010	0.14	0.00
2	0.207	0.125	1.64	77	-2.62	94	85	-0.010	0.04	0.01
3	0.333	0.126	1.66	77	-2.7	95	85	0.000	8.41	0.52
4	0.456	0.123	1.63	77	0	96	86	0.000	11.25	0.82
5	0.580	0.124	1.64	77	0	93	86	0.000	9.63	0.24
6	0.707	0.127	1.68	77	-0.34	99	86	0.000	9.15	0.17
7	0.833	0.126	1.68	77	-2.53	97	86	0.000	11.01	0.15
8	0.957	0.124	1.68	77	-0.79	97	86	0.000	11.01	0.14
9	1.081	0.124	1.67	78	-0.59	96	86	0.000	10.81	0.13
10	1.209	0.128	1.68	78	-3.18	98	86	-0.010	11.48	0.20
11	1.333	0.124	1.68	78	-3.2	94	86	0.000	11.57	0.22
12	1.458	0.125	1.68	78	-0.02	98	86	0.000	11.45	0.22
13	1.585	0.127	1.67	78	-3.21	102	86	0.000	11.69	0.18
14	1.711	0.126	1.69	79	-3.01	102	86	0.000	12.18	0.24
15	1.836	0.125	1.67	79	-0.69	100	86	-0.010	12.42	0.30
16	1.960	0.124	1.67	79	-1.35	98	86	0.010	12.86	0.29
17	2.087	0.127	1.67	79	-0.12	105	86	0.000	12.79	0.28
18	2.212	0.125	1.67	80	-0.19	101	85	0.000	11.97	0.24
19	2.335	0.123	1.68	80	-1.27	95	85	0.000	11.51	0.15
20	2.463	0.128	1.68	80	-2.94	106	85	0.010	11.27	0.09
21	2.590	0.127	1.68	81	-0.03	98	85	0.000	10.57	0.10
22	2.715	0.125	1.67	81	-0.04	98	85	0.000	10.87	0.16
23	2.840	0.125	1.67	81	-0.31	97	85	0.000	10.58	0.11
24	2.967	0.127	1.67	81	-3.12	98	85	0.000	10.77	0.10
25	3.093	0.126	1.68	82	-3.12	100	85	0.000	11.17	0.13
26	3.217	0.124	1.68	82	-2.32	97	85	0.010	11.36	0.19
27	3.345	0.128	1.68	82	-0.17	104	85	0.000	11.26	0.15
28	3.473	0.128	1.68	83	-0.04	100	85	0.010	10.77	0.12
29	3.597	0.124	1.68	83	-3.1	97	85	0.010	10.45	0.09
30	3.722	0.125	1.67	83	-3.09	100	85	0.000	11.00	0.08
31	3.850	0.128	1.68	84	-2.81	106	85	0.000	10.61	0.07

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 1Technician: AKDate: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	3.976	0.126	1.67	84	-3.22	99	85	0.000	10.50	0.06
33	4.102	0.126	1.68	84	-0.06	102	85	0.000	9.91	0.10
34	4.229	0.127	1.68	85	-3.05	103	85	-0.010	10.03	0.11
35	4.357	0.128	1.68	85	-3.26	100	85	0.000	10.21	0.09
36	4.481	0.124	1.67	85	-2.96	100	85	0.000	9.70	0.09
37	4.605	0.124	1.62	86	-0.69	96	85	0.000	7.89	0.43
38	4.731	0.126	1.69	86	-3.3	104	85	0.000	7.36	0.38
39	4.859	0.128	1.70	87	-3.21	96	85	-0.010	8.65	0.31
40	4.985	0.126	1.67	87	-3.37	103	85	0.000	8.59	0.20
41	5.110	0.125	1.56	87	-3.52	97	85	0.000	11.44	0.33
42	5.232	0.122	1.54	87	-2.67	100	85	0.000	11.04	0.37
43	5.352	0.120	1.52	88	-0.47	97	85	0.000	10.63	0.30
44	5.472	0.120	1.50	88	-3.22	94	85	0.000	10.99	0.28
45	5.591	0.119	1.46	88	-0.58	94	85	-0.010	11.73	0.34
46	5.709	0.118	1.41	88	-0.72	91	84	0.000	12.09	0.38
47	5.825	0.116	1.39	89	-0.86	92	85	0.000	12.18	0.33
48	5.940	0.115	1.38	89	-1.5	94	85	0.000	12.16	0.27
49	6.067	0.127	1.75	89	-2.56	100	85	0.010	12.18	0.28
50	6.199	0.132	1.74	89	-1.1	101	85	-0.010	12.14	0.25
51	6.329	0.130	1.74	90	-1.38	99	85	0.000	12.26	0.24
52	6.457	0.128	1.75	90	-1.05	94	85	0.000	12.21	0.25
53	6.588	0.131	1.74	90	-3.98	107	85	0.000	12.37	0.23
54	6.718	0.130	1.73	90	-1.05	102	85	0.000	12.37	0.22
55	6.847	0.129	1.74	91	-3.58	95	85	0.000	12.51	0.23
56	6.977	0.130	1.73	91	-1.62	107	85	0.010	12.52	0.21
57	7.106	0.129	1.73	91	-1.1	101	85	0.000	12.67	0.20
58	7.234	0.128	1.73	91	-3.44	99	85	0.000	12.60	0.22
59	7.364	0.130	1.72	92	-3.08	100	85	0.000	12.58	0.26
60	7.492	0.128	1.73	92	-1.38	98	85	0.000	12.58	0.23
61	7.620	0.128	1.71	92	-1.61	102	85	0.010	12.49	0.21
62	7.751	0.131	1.73	92	-3.33	102	85	0.000	12.52	0.24
63	7.879	0.128	1.72	93	-2.66	98	85	0.000	12.52	0.22

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	8.006	0.127	1.70	93	-1.19	102	85	0.000	12.47	0.25
65	8.137	0.131	1.70	93	-2.05	106	85	0.000	12.57	0.29
66	8.266	0.129	1.68	93	-1.24	100	85	0.000	12.82	0.35
67	8.391	0.125	1.67	93	-4.1	103	85	-0.010	12.87	0.39
68	8.517	0.126	1.65	94	-2.48	98	85	0.000	13.03	0.38
69	8.646	0.129	1.61	94	-1.36	103	85	-0.080	13.05	0.39
70	8.769	0.123	1.59	94	-1.37	93	85	-0.070	13.20	0.43
71	8.892	0.123	1.56	94	-4.34	98	85	-0.090	13.24	0.43
72	9.019	0.127	1.70	94	-2.37	104	85	-0.090	13.44	0.47
73	9.147	0.128	1.64	95	-4.03	104	85	-0.080	13.57	0.50
74	9.269	0.122	1.56	95	-2.83	94	85	-0.080	13.63	0.50
75	9.395	0.126	1.70	95	-2.52	104	84	-0.090	13.74	0.53
76	9.523	0.128	1.60	95	-3.78	102	84	-0.090	13.72	0.50
77	9.655	0.132	1.82	95	-3.09	107	84	-0.080	13.75	0.50
78	9.786	0.131	1.74	96	-3.2	106	85	-0.080	13.82	0.54
79	9.919	0.133	1.85	96	-2.95	105	84	-0.080	13.73	0.51
80	10.048	0.129	1.68	96	-2.79	99	84	-0.070	13.69	0.51
81	10.175	0.127	1.74	96	-5.73	103	85	-0.090	13.76	0.48
82	10.309	0.134	1.83	96	-5.76	102	85	-0.080	13.76	0.48
83	10.443	0.134	1.88	96	-2.75	106	85	-0.080	13.77	0.52
84	10.581	0.138	1.90	97	-4.32	109	85	-0.080	13.72	0.48
85	10.715	0.134	1.74	97	-5.03	108	85	-0.090	13.70	0.47
86	10.844	0.129	1.73	97	-5.41	103	85	-0.090	13.67	0.44
87	10.976	0.132	1.73	97	-2.98	105	85	-0.080	13.81	0.44
88	11.106	0.130	1.75	97	-3.13	100	85	-0.100	13.75	0.49
89	11.234	0.128	1.73	97	-5.42	101	85	-0.080	13.87	0.46
90	11.368	0.134	1.78	97	-5.41	107	85	-0.090	13.80	0.48
91	11.498	0.130	1.77	98	-3.21	100	85	-0.090	13.75	0.47
92	11.629	0.131	1.77	98	-2.53	107	85	-0.080	13.78	0.48
93	11.763	0.134	1.80	98	-5.31	107	85	-0.070	13.81	0.50
94	11.891	0.128	1.61	98	-5.22	100	85	-0.080	13.76	0.51
95	12.019	0.128	1.67	98	-5.19	102	85	-0.080	13.75	0.51

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 1Technician: AKDate: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	12.148	0.129	1.66	98	-5.15	105	85	-0.090	13.76	0.44
97	12.274	0.126	1.60	99	-3.24	98	85	-0.090	13.85	0.69
98	12.397	0.123	1.59	99	-5.21	98	85	-0.080	13.61	0.53
99	12.524	0.127	1.76	99	-4	98	85	-0.080	13.52	0.38
100	12.659	0.135	1.77	99	-2.27	111	85	-0.080	13.31	0.34
101	12.787	0.128	1.73	99	-2.32	99	85	-0.090	13.20	0.33
102	12.917	0.130	1.73	99	-4.46	101	85	-0.080	13.19	0.32
103	13.050	0.133	1.75	99	-2.45	108	85	-0.080	13.35	0.35
104	13.179	0.129	1.75	99	-2.68	99	85	-0.090	13.27	0.34
105	13.310	0.131	1.75	99	-2.94	105	85	-0.090	13.10	0.29
106	13.444	0.134	1.75	100	-2.8	97	85	-0.090	13.05	0.24
107	13.573	0.129	1.78	100	-2.49	101	85	-0.090	12.88	0.22
108	13.707	0.134	1.79	100	-3.56	109	84	-0.080	12.84	0.17
109	13.840	0.133	1.79	100	-3.29	107	84	-0.080	12.68	0.18
110	13.968	0.128	1.67	100	-1.85	95	84	-0.070	12.55	0.15
111	14.099	0.131	1.69	100	-4.79	101	84	-0.070	11.89	0.17
112	14.229	0.130	1.71	100	-1.75	97	84	-0.080	11.07	0.15
113	14.357	0.128	1.73	100	-3.02	94	84	-0.070	10.47	0.12
114	14.489	0.132	1.74	100	-1.73	100	84	-0.080	10.07	0.10
115	14.621	0.132	1.75	101	-1.91	97	84	-0.080	9.66	0.10
116	14.750	0.129	1.75	101	-1.86	102	84	-0.070	9.38	0.07
117	14.884	0.134	1.76	101	-2.19	101	84	-0.090	9.08	0.06
118	15.016	0.132	1.77	101	-2.4	104	84	-0.070	8.94	0.06
119	15.147	0.131	1.78	101	-4.59	102	84	-0.060	8.73	0.04
120	15.280	0.133	1.75	101	-3.74	103	84	-0.080	8.27	0.04
121	15.411	0.131	1.74	101	-2.13	99	84	-0.070	8.10	0.05
122	15.542	0.131	1.76	101	-2.5	98	84	-0.080	7.85	0.05
123	15.675	0.133	1.76	101	-2.19	101	84	-0.060	7.90	0.07
124	15.806	0.131	1.76	101	-3.06	105	84	-0.070	7.77	0.08
125	15.937	0.131	1.78	102	-3.37	100	84	-0.070	7.67	0.07
126	16.071	0.134	1.77	102	-1.69	105	84	-0.070	7.55	0.06
127	16.203	0.132	1.79	102	-4.53	100	84	-0.070	7.44	0.06

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
128	16.334	0.131	1.74	102	-3.78	95	84	-0.070	7.45	0.07
129	16.466	0.132	1.69	102	-1.44	103	84	-0.070	7.53	0.07
130	16.594	0.128	1.69	102	-1.93	96	84	-0.060	7.27	0.06
131	16.721	0.127	1.70	102	-2.33	102	84	-0.070	7.09	0.05
132	16.852	0.131	1.69	102	-3.66	103	84	-0.070	6.88	0.06
133	16.982	0.130	1.70	102	-2.38	97	84	-0.060	6.73	0.07
134	17.110	0.128	1.69	102	-2.1	102	84	-0.080	6.69	0.09
135	17.241	0.131	1.69	102	-4.54	109	84	-0.060	6.68	0.08
136	17.370	0.129	1.70	102	-4.57	100	84	-0.060	6.39	0.09
137	17.500	0.130	1.71	102	-1.55	95	84	-0.080	6.14	0.11
138	17.630	0.130	1.72	102	-4.44	100	84	-0.080	6.19	0.10
139	17.760	0.130	1.71	102	-4.45	97	84	-0.050	6.10	0.12
140	17.889	0.129	1.70	103	-2.53	98	84	-0.060	5.96	0.12
141	18.020	0.131	1.71	103	-2.11	100	84	-0.070	6.03	0.13
142	18.150	0.130	1.71	103	-2.98	95	84	-0.060	5.90	0.14
143	18.279	0.129	1.72	103	-1.57	98	84	-0.070	5.88	0.15
144	18.411	0.132	1.71	103	-4.2	102	84	-0.060	5.90	0.16
Avg/Tot	18.411	0.128	1.68	92	-2.62	100	85	-0.041	10.88	0.25

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 1Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	78	77	81	75	74	77.0	N/A
1	78	77	81	86	74	79.2	N/A
2	78	78	82	138	74	90.0	N/A
3	81	81	84	204	74	104.8	N/A
4	87	86	87	248	74	116.4	N/A
5	96	93	92	272	74	125.4	N/A
6	106	100	98	288	74	133.2	N/A
7	117	107	105	307	74	142.0	N/A
8	127	116	89	325	73	146.0	N/A
9	135	125	89	342	73	152.8	N/A
10	144	134	91	357	73	159.8	N/A
11	153	144	94	370	73	166.8	N/A
12	163	155	97	385	73	174.6	N/A
13	174	166	103	395	73	182.2	N/A
14	185	177	103	403	73	188.2	N/A
15	196	185	104	409	73	193.4	N/A
16	207	196	106	414	74	199.4	N/A
17	218	207	109	421	74	205.8	N/A
18	228	219	111	425	74	211.4	N/A
19	239	230	115	427	74	217.0	N/A
20	248	241	118	427	74	221.6	N/A
21	258	251	122	426	74	226.2	N/A
22	267	261	125	425	74	230.4	N/A
23	276	271	128	425	75	235.0	N/A
24	284	280	132	425	75	239.2	N/A
25	292	289	135	426	75	243.4	N/A
26	300	297	139	428	75	247.8	N/A
27	308	306	143	427	76	252.0	N/A
28	317	314	146	427	76	256.0	N/A
29	324	321	150	426	76	259.4	N/A
30	331	329	154	425	77	263.2	N/A
31	339	336	158	425	77	267.0	N/A
32	345	343	162	423	78	270.2	N/A
33	351	349	166	419	78	272.6	N/A
34	358	356	170	416	78	275.6	N/A
35	364	362	174	413	79	278.4	N/A
36	371	368	178	411	79	281.4	N/A
37	377	374	184	415	80	286.0	N/A
38	382	380	189	416	81	289.6	N/A
39	387	385	193	421	81	293.4	N/A
40	391	388	197	423	82	296.2	N/A
41	395	391	201	428	83	299.6	N/A
42	398	393	204	429	83	301.4	N/A
43	400	395	207	430	84	303.2	N/A
44	402	398	210	431	85	305.2	N/A
45	404	401	212	434	85	307.2	N/A
46	406	404	214	439	86	309.8	N/A
47	408	407	216	444	87	312.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 1Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	411	410	218	449	88	315.2	N/A
49	413	413	220	453	88	317.4	N/A
50	416	416	222	457	89	320.0	N/A
51	418	420	224	461	90	322.6	N/A
52	421	423	226	466	90	325.2	N/A
53	423	427	229	470	91	328.0	N/A
54	426	431	231	473	92	330.6	N/A
55	429	435	234	475	92	333.0	N/A
56	432	439	237	478	93	335.8	N/A
57	435	443	239	482	94	338.6	N/A
58	438	447	242	484	94	341.0	N/A
59	441	450	244	487	95	343.4	N/A
60	444	455	247	489	95	346.0	N/A
61	447	459	249	492	96	348.6	N/A
62	451	463	252	493	97	351.2	N/A
63	454	467	254	496	98	353.8	N/A
64	456	470	257	497	98	355.6	N/A
65	460	474	260	500	98	358.4	N/A
66	463	478	262	500	99	360.4	N/A
67	466	482	265	503	100	363.2	N/A
68	469	485	267	506	100	365.4	N/A
69	472	490	270	508	101	368.2	N/A
70	476	494	273	509	101	370.6	N/A
71	479	498	276	511	101	373.0	N/A
72	483	502	278	513	103	375.8	N/A
73	486	506	281	515	103	378.2	N/A
74	490	510	284	517	103	380.8	N/A
75	494	514	286	520	104	383.6	N/A
76	497	518	289	521	104	385.8	N/A
77	501	522	292	522	105	388.4	N/A
78	505	526	295	525	105	391.2	N/A
79	508	530	298	527	106	393.8	N/A
80	511	534	301	528	107	396.2	N/A
81	515	538	304	528	107	398.4	N/A
82	519	542	308	528	108	401.0	N/A
83	522	545	310	527	108	402.4	N/A
84	526	548	314	529	109	405.2	N/A
85	529	552	317	531	110	407.8	N/A
86	533	556	321	533	111	410.8	N/A
87	537	559	324	536	112	413.6	N/A
88	540	562	327	536	112	415.4	N/A
89	544	565	331	538	113	418.2	N/A
90	547	568	334	539	114	420.4	N/A
91	551	571	337	540	114	422.6	N/A
92	554	574	340	541	114	424.6	N/A
93	558	577	343	541	115	426.8	N/A
94	561	579	346	542	116	428.8	N/A
95	554	585	350	537	117	428.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
96	536	591	366	497	119	421.8	N/A	
97	529	593	391	483	121	423.4	N/A	
98	525	594	411	476	123	425.8	N/A	
99	521	596	533	475	125	450.0	N/A	
100	518	598	520	475	127	447.6	N/A	
101	516	598	593	471	128	461.2	N/A	
102	515	600	595	471	130	462.2	N/A	
103	513	602	615	469	131	466.0	N/A	
104	512	603	598	470	133	463.2	N/A	
105	512	606	635	469	135	471.4	N/A	
106	512	606	637	467	136	471.6	N/A	
107	512	608	643	464	138	473.0	N/A	
108	513	610	644	463	139	473.8	N/A	
109	513	612	650	461	141	475.4	N/A	
110	512	613	662	460	142	477.8	N/A	
111	513	615	667	453	144	478.4	N/A	
112	514	617	670	445	145	478.2	N/A	
113	515	618	673	437	147	478.0	N/A	
114	514	619	676	428	148	477.0	N/A	
115	514	621	679	419	150	476.6	N/A	
116	515	621	682	411	152	476.2	N/A	
117	514	621	683	405	153	475.2	N/A	
118	513	622	686	399	154	474.8	N/A	
119	513	622	687	393	156	474.2	N/A	
120	512	622	689	387	157	473.4	N/A	
121	510	621	691	382	158	472.4	N/A	
122	508	620	689	377	160	470.8	N/A	
123	506	618	680	373	161	467.6	N/A	
124	503	616	576	369	162	445.2	N/A	
125	501	613	536	365	164	435.8	N/A	
126	498	609	521	361	165	430.8	N/A	
127	496	607	514	358	166	428.2	N/A	
128	493	602	509	355	167	425.2	N/A	
129	496	601	508	352	169	425.2	N/A	
130	495	600	516	351	170	426.4	N/A	
131	493	598	532	348	171	428.4	N/A	
132	492	597	538	346	172	429.0	N/A	
133	490	594	529	344	173	426.0	N/A	
134	488	591	526	342	174	424.2	N/A	
135	485	589	520	340	175	421.8	N/A	
136	483	586	531	337	176	422.6	N/A	
137	481	582	512	335	177	417.4	N/A	
138	477	580	512	332	178	415.8	N/A	
139	475	576	518	330	179	415.6	N/A	
140	472	572	519	328	181	414.4	N/A	
141	468	569	521	325	182	413.0	N/A	
142	466	566	549	323	183	417.4	N/A	
143	462	563	546	320	184	415.0	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	459	559	561	319	185	416.6	N/A
Average	416	453	334	428	112	349	N/A

LAB SAMPLE DATA - ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 1

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T463	94.7	94.7	98.0	3.3
Train A Filters - Remainder	T464	94.7	189.8	191.3	1.5
	T465	95.1			
Train A Probe	2A	116239.5	116239.5	116241.0	1.5
Train A O-Rings	2A	3552.5	3552.5	3552.3	0.0*
Train B Filters	T466	95.3	191.8	194.1	2.3
	T467	96.5			
Train B Probe	2B	116328.5	116328.5	116330.5	2.0
Train B O-Rings	2B	3571.6	3571.6	3573.3	1.7
Background Filter			0.0	0.0	

**Negative value corrected to zero*

Placed in Dessicator on:	
---------------------------------	--

Train A Filters - First Hour	97.9	5/18 8:34	98.0	5/19 8:50		
Train A Filters - Remainder	191.2	5/18 8:34	191.3	5/19 8:50		
Train A Probe	116241.1	5/18 8:30	116241.0	5/19 8:45		
Train A O-Rings	3552.2	5/18 8:32	3552.3	5/19 8:47		
Train B Filters	194.1	5/18 8:34	194.1	5/19 8:50		
Train B Probe	116330.6	5/18 8:30	116330.5	5/19 8:45		
Train B O-Rings	3573.2	5/18 8:32	3573.3	5/19 8:47		
Background Filter						

1st hour Sub-Total, mg:	3.3
Remainder Sub-Total, mg:	3.0
Train 1 Aggregate, mg:	6.3
Train 2 Aggregate, mg:	6.0
Ambient Aggregate, mg:	0.0

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 20-601 Tracking #: 0071
 Model: 15-W06 Run Number: 1 Test Date: 5/15/2020

Wood Heater Run Notes

Pre-Test Notes

Pre-Test Start Time: N/A
 Air Control Setting: N/A

Time	Notes
	N/A – High Burn

Test Notes

Test Burn Start Time: 11:20
 Air Control Setting: Maximum

Time	Notes
0:00-1:00	Torch Ignition
4:40	Door Closed
37:00	Test fuel loaded
38:30	Door closed, air set
60:00	Changed filter A

Test Burn End Time: 14:25

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO₂ (%): 16.9 CO (%): 4.18
 Mid Gas CO₂ (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	5/15 8:30	5/15 8:35	5/15 8:32	5/16 10:38	5/16 10:44	5/16 10:41
CO ₂	0.00	9.96	16.90	-0.01	9.87	16.86
CO	0.000	2.427	4.180	-0.001	2.418	4.177

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

Technician Signature: 

Date: 5/28/2020
 Page 1 of 3

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works

Job Number: 20-601

Tracking #: 0071

Model: 15-W06

Run Number: 1

Test Date: 5/15/2020

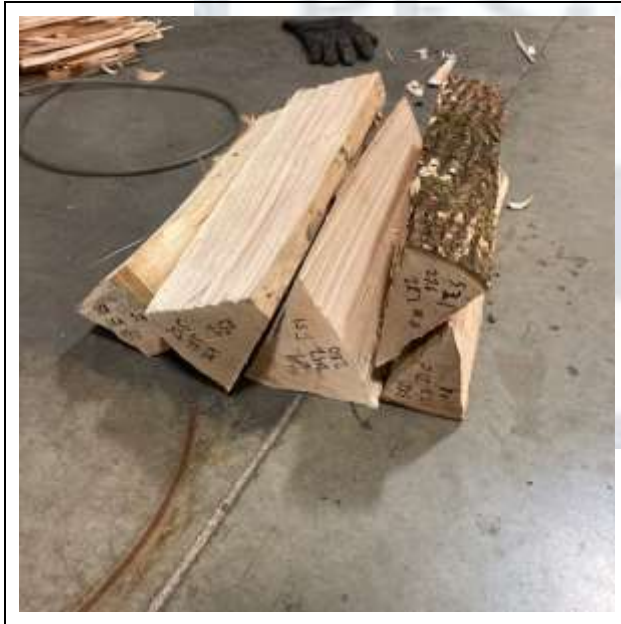
Test Photos



Kindling Fuel Load



Start-up Fuel Load



High Fire Fuel Load



Technician Signature: _____

Date: 5/28/2020
Page 2 of 3

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515



Run 2 Data Summary

Client: England's Stove Works
Model: 15-W06
Job #: 20-601
Tracking #: 0071
Test Date: 5/15/2020



Technician Signature

6/2/2020

Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: England's Stove WorksModel: 15-W06Run #: 2Job #: 20-601Tracking #: 0071Technician: AKDate: 5/15/2020

Burn Rate (kg/hr):	1.19
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	0.000	83.410	79.860	7.848
Average Gas Velocity in Dilution Tunnel (ft/sec)	16.57			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	10992.1			
Average Gas Meter Temperature (°F)	74.5	101.5	103.5	99.4
Total Sample Volume (dscf)	0.000	80.155	76.139	7.570
Average Tunnel Temperature (°F)	94.2			
Total Time of Test (min)	635			
Total Particulate Catch (mg)	0.0	8.0	6.6	5.4
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000998	0.0000867	0.0007134
Total PM Emissions (g)	0.00	11.61	10.08	7.84
Particulate Emission Rate (g/hr)	0.00	1.10	0.95	7.84
Emissions Factor (g/kg)	-	0.92	0.80	-
Difference from Average Total Particulate Emissions (g)	-	0.76	0.76	-
Difference from Average Emissions Factor (g/kg)	-	0.06	0.06	-

Final Average Results	
Total Particulate Emissions (g)	10.85
Particulate Emission Rate (g/hr)	1.02
Emissions Factor (g/kg)	0.86
HHV Efficiency (%)	73.2%
LHV Efficiency (%)	78.3%
CO Emissions (g/min)	1.68

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 80 / Max: 86	OK
Face Velocity	< 30 ft/min	7.3	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min: 71 / Max: 79	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	CHECK 10 MIN. INTERVAL PRO-RATES

B415.1 Efficiency Results

Manufacturer: Island's Stove Works
Model: 15-W06
Date: 05/15/20
Run: 2
Control #: 20-601
Test Duration: 599
Output Category: Low

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	73.2%	78.3%
Combustion Efficiency	94.8%	94.8%
Heat Transfer Efficiency	77.2%	82.6%

Output Rate (kJ/h)	18,471	17,521	(Btu/h)
Burn Rate (kg/h)	1.26	2.79	(lb/h)
Input (kJ/h)	25,236	23,939	(Btu/h)

Test Load Weight (dry kg)	12.62	27.82	dry lb
MC wet (%)	16.71		
MC dry (%)	20.06		
Particulate (g)	10.85		
CO (g)	1,006		
Test Duration (h)	9.98		

Emissions	Particulate	CO
g/MJ Output	0.06	5.45
g/kg Dry Fuel	0.86	79.67
g/h	1.09	100.73
g/min	0.02	1.68
lb/MM Btu Output	0.14	12.67

Air/Fuel Ratio (A/F)	18.50
-----------------------------	-------

VERSION:

2.2

12/14/2009

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking # 0071
 Technician: AK
 Date: 5/15/2020

Nominal Loading Density (lbs/ft³, wet basis): 10
 Usable Firebox Volume (ft³): 2.86
 Target Load Weight (lbs): **28.60**
 Total Load Weight Range (lbs): **27.20** to **30.00**
 Core Load Weight Range (lbs): 12.90 to 18.60
 Remainder Load Weight Range (lbs): 10.00 to 15.70
 Core Load Piece Range (lbs): **4.30** to **7.20**
 Remainder Load Piece Range (lbs): **2.90** to **15.70**
 Max Allowable Kindling Weight (lbs): 5.45
 Max Allowable Start-up Fuel Weight (lbs): 8.18

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		5.49	In Range	20.4	21.9	23.0	21.8	In Range	4.51	2.05
2		4.84	In Range	19.4	28.9	19.6	22.6	In Range	3.95	1.79
3		5.63	In Range	19.1	28.0	19.5	22.2	In Range	4.61	2.09
Core Load Wt. (lbs)		15.96	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		4.36	In Range	22.4	19.2	20.1	20.6	In Range	3.62	1.64
2		6.93	In Range	18.0	21.3	19.5	19.6	In Range	5.79	2.63
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		11.29	In Range							

Total Load Weight (lbs): **27.25** 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: 95% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 9.5
 Total Load Average Moisture Content (%DB): **21.3** In Range 19-25%
 Total Load Average Moisture Content (%WB): 17.5
 Total Test Load Weight (dry basis): 22.47 lbs 10.19 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
4.86	In Range	10	10	10	10.0	In Range	4.42	2.00

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
6.63	In Range	19.5	22.6	21.8	21.3	In Range	5.47	2.48

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): **2.7** to **5.5**
 Actual Residual Start-up Fuel Weight (lb): **3.4** In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Nominal Loading Density (lbs/ft³, wet basis): 12
 Usable Firebox Volume (ft³): 2.86
 Target Load Weight (lbs): **34.32**
 Total Load Weight Range (lbs): **32.60** to **36.04**
 Core Load Weight Range (lbs): 15.44 to 22.31
 Remainder Load Weight Range (lbs): 12.01 to 18.88
 Core Load Piece Range (lbs): **5.15** to **8.58**
 Remainder Load Piece Range (lbs): **3.43** to **10.30**

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		5.71	In Range	25.7	18.6	23.2	22.5	In Range	4.66	2.11
2		5.59	In Range	19.1	18.4	18.6	18.7	In Range	4.71	2.14
3		5.31	In Range	19.1	22.8	19.2	20.4	In Range	4.41	2.00
Core Load Wt. (lbs)		16.61	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		8.88	In Range	18.4	20.8	17.5	18.9	In Range	7.47	3.39
2		3.48	In Range	20.0	18.1	19.1	19.1	In Range	2.92	1.33
3		4.47	In Range	22.7	19.1	22.7	21.5	In Range	3.68	1.67
Remainder Load (lbs)		16.83	In Range							

Remainder Load Small/Large Piece Weight Ratio: 39% In Range ≤ 67%
 Total Load Weight (lbs): **33.44** In Range
 Core Load % of Total Weight: 50% In Range 45-65%
 Remainder % of Total Weight: 50% In Range 35-55%
 Total Load % of Target Weight: 97% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 11.7
 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): 27.85 lbs 12.63 kg

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 3.4 to 6.6
 Actual Charcoal Bed Wt. (lb): 4.0 In Range

TEST END POINT

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

Total Fuel Burned During Test Run: 33.4 lbs, wet basis
 27.9 lbs, dry basis
 12.63 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: England's Stove Works

Model: 15-W06

Run #: 2

Test Start Time: 14:54

Test Type: Low Fire

Job #: 20-601

Tracking #: 0071

Technician: AK

Date: 5/15/2020

Recording Interval (min): 1

Total Sampling Time (min): 635

Meter Box γ Factor: 1.012 (A)Meter Box γ Factor: 1.008 (B)Meter Box γ Factor: (Ambient)Induced Draft Check (in. H₂O): 0

Smoke Capture Check (%): 100%

Date Flue Pipe Last Cleaned: 5/14/2020

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.08	30.12	30.10
Relative Humidity (%)	38.0	47.0	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:			ft ³

Sample Train Post-Test Leak Checks

(A) 0.000 cfm @ -5 in. Hg

(B) 0.001 cfm @ -10 in. Hg

(Ambient) cfm @ in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.038	74
2	0.072	74
3	0.074	74
4	0.066	74
5	0.026	74
6	0.076	74
7	0.076	74
8	0.038	74
Center	0.080	74

Dilution Tunnel H₂O: 2.00 percent

Tunnel Diameter: 6 inches

Pitot Tube Cp: 0.99 [unitless]

Dilution Tunnel MW(dry): 29.00 lb/lb-mole

Dilution Tunnel MW(wet): 28.78 lb/lb-mole

Tunnel Area: 0.1963 ft²V_{strav}: 16.12 ft/secV_{scnt}: 18.81 ft/secF_p: 0.857 [ratio]

Initial Tunnel Flow: 181.2 scf/min

Static Pressure: -0.200 in. H₂O

TEST FUEL PROPERTIES

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

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

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.090	0.02	100	-0.18		33.4		118	386	86	78
1	0.121	0.121	0.071	1.71	99	-0.81	102	33.3	-0.1	129	349	86	79
2	0.250	0.129	0.077	1.68	99	-0.83	104	33.2	-0.1	123	350	86	79
3	0.382	0.132	0.083	1.67	99	-0.51	102	33.0	-0.2	119	348	86	78
4	0.510	0.128	0.079	1.67	98	-0.71	102	32.8	-0.2	123	366	86	78
5	0.635	0.125	0.077	1.63	98	-0.45	101	32.7	-0.1	127	372	86	79
6	0.767	0.132	0.078	1.67	98	-0.64	106	32.4	-0.3	123	397	85	78
7	0.896	0.129	0.082	1.67	98	-0.84	101	32.2	-0.2	127	463	85	78
8	1.022	0.126	0.075	1.66	98	-0.45	104	31.8	-0.4	131	519	85	78
9	1.154	0.132	0.086	1.78	98	-0.82	102	31.5	-0.3	136	554	85	78
10	1.288	0.134	0.079	1.68	98	-0.71	109	31.0	-0.5	142	589	85	78
11	1.414	0.126	0.086	1.66	98	-0.49	98	30.8	-0.2	145	606	85	79
12	1.550	0.136	0.083	1.80	98	-0.95	108	30.5	-0.3	145	608	86	79
13	1.681	0.131	0.073	1.70	98	-0.64	111	30.1	-0.4	143	591	86	79
14	1.811	0.130	0.081	1.73	98	-0.4	104	29.9	-0.2	139	563	86	79
15	1.945	0.134	0.085	1.71	98	-0.83	104	29.6	-0.3	133	518	86	79
16	2.074	0.129	0.094	1.72	98	-0.73	95	29.4	-0.2	129	493	86	79
17	2.203	0.129	0.073	1.71	98	-0.73	107	29.2	-0.2	127	476	86	79
18	2.338	0.135	0.075	1.74	98	-0.56	111	29.0	-0.2	125	461	86	79
19	2.467	0.129	0.074	1.72	98	-1.03	106	28.8	-0.2	124	455	86	79
20	2.597	0.130	0.076	1.70	98	-0.81	106	28.7	-0.1	123	449	86	79
21	2.730	0.133	0.078	1.71	98	-0.77	107	28.5	-0.2	123	448	86	79
22	2.860	0.130	0.071	1.71	98	-0.87	109	28.3	-0.2	122	449	86	78
23	2.990	0.130	0.075	1.73	99	-0.66	106	28.1	-0.2	122	449	86	79
24	3.123	0.133	0.077	1.70	99	-0.95	107	27.9	-0.2	122	449	86	79
25	3.254	0.131	0.082	1.70	99	-0.59	102	27.8	-0.1	121	448	86	78
26	3.385	0.131	0.078	1.72	99	-0.82	105	27.6	-0.2	121	446	86	79
27	3.517	0.132	0.088	1.71	99	-0.92	99	27.4	-0.2	121	445	86	79
28	3.647	0.130	0.078	1.73	99	-0.77	104	27.2	-0.2	120	443	86	79
29	3.778	0.131	0.077	1.72	99	-0.9	105	27.1	-0.1	120	441	86	78
30	3.910	0.132	0.080	1.72	99	-0.83	104	26.9	-0.2	120	439	86	78
31	4.041	0.131	0.093	1.71	99	-0.9	96	26.7	-0.2	120	438	86	78
32	4.171	0.130	0.080	1.74	99	-0.93	103	26.6	-0.1	120	436	86	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.304	0.133	0.079	1.73	99	-0.77	106	26.4	-0.2	119	433	86	78
34	4.434	0.130	0.075	1.70	99	-0.65	106	26.2	-0.2	119	432	86	78
35	4.565	0.131	0.074	1.71	100	-0.8	107	26.1	-0.1	119	430	86	78
36	4.699	0.134	0.080	1.70	100	-0.63	105	25.9	-0.2	118	426	86	78
37	4.828	0.129	0.079	1.73	100	-0.94	102	25.7	-0.2	118	426	86	78
38	4.958	0.130	0.084	1.69	100	-0.67	100	25.6	-0.1	118	426	86	78
39	5.092	0.134	0.089	1.71	100	-0.94	100	25.4	-0.2	118	424	86	78
40	5.221	0.129	0.087	1.70	100	-0.72	97	25.4	0	118	421	86	78
41	5.352	0.131	0.086	1.69	100	-0.4	99	25.1	-0.3	118	421	86	78
42	5.486	0.134	0.087	1.69	100	-0.66	101	24.9	-0.2	117	421	86	78
43	5.614	0.128	0.070	1.75	100	-0.93	108	24.8	-0.1	117	419	86	78
44	5.747	0.133	0.089	1.71	100	-0.78	99	24.6	-0.2	117	420	86	79
45	5.880	0.133	0.088	1.69	100	-0.75	100	24.5	-0.1	117	418	86	78
46	6.008	0.128	0.083	1.71	100	-0.71	99	24.3	-0.2	117	417	86	78
47	6.142	0.134	0.073	1.73	101	-0.54	110	24.1	-0.2	116	417	86	78
48	6.273	0.131	0.073	1.71	101	-0.95	107	24.0	-0.1	115	407	85	78
49	6.401	0.128	0.088	1.71	101	-0.65	95	23.8	-0.2	114	401	85	78
50	6.536	0.135	0.082	1.70	101	-0.8	104	23.6	-0.2	115	396	86	78
51	6.667	0.131	0.075	1.67	101	-0.91	106	23.5	-0.1	114	395	86	78
52	6.796	0.129	0.077	1.71	101	-0.81	103	23.3	-0.2	114	393	86	78
53	6.931	0.135	0.089	1.73	101	-0.85	100	23.2	-0.1	113	390	86	78
54	7.060	0.129	0.089	1.71	101	-0.98	96	23.0	-0.2	113	389	86	78
55	7.191	0.131	0.077	1.71	101	-0.89	104	22.9	-0.1	113	386	86	78
56	7.324	0.133	0.089	1.72	101	-0.93	98	22.7	-0.2	112	385	86	78
57	7.454	0.130	0.080	1.68	101	-0.96	102	22.6	-0.1	112	384	86	78
58	7.585	0.131	0.073	1.68	101	-0.71	107	22.4	-0.2	112	383	86	78
59	7.718	0.133	0.075	1.69	101	-0.83	107	22.3	-0.1	112	383	86	78
60	7.848	0.130	0.087	1.70	101	-1	97	22.2	-0.1	112	384	86	78
61	7.979	0.131	0.083	1.68	101	-0.65	100	22.0	-0.2	112	385	86	78
62	8.114	0.135	0.082	1.83	101	-0.73	104	21.9	-0.1	112	387	85	78
63	8.247	0.133	0.073	1.72	102	-0.67	109	21.7	-0.2	112	389	86	78
64	8.379	0.132	0.084	1.70	101	-0.74	101	21.6	-0.1	112	391	86	78
65	8.514	0.135	0.080	1.70	102	-0.77	105	21.5	-0.1	112	393	86	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	8.644	0.130	0.087	1.71	102	-0.46	97	21.3	-0.2	112	396	86	78
67	8.780	0.136	0.079	1.72	102	-0.56	107	21.1	-0.2	112	399	86	78
68	8.912	0.132	0.077	1.75	102	-0.73	105	21.0	-0.1	113	403	86	78
69	9.043	0.131	0.087	1.76	102	-0.49	98	20.8	-0.2	113	406	86	78
70	9.179	0.136	0.084	1.77	102	-0.66	104	20.7	-0.1	113	408	86	78
71	9.310	0.131	0.069	1.76	102	-0.71	110	20.5	-0.2	113	412	86	78
72	9.443	0.133	0.080	1.72	102	-0.76	104	20.4	-0.1	114	415	86	78
73	9.577	0.134	0.083	1.75	102	-0.55	103	20.2	-0.2	114	418	86	78
74	9.709	0.132	0.085	1.75	102	-0.49	100	20.1	-0.1	114	420	86	78
75	9.841	0.132	0.088	1.73	102	-0.68	98	19.8	-0.3	114	422	86	79
76	9.976	0.135	0.075	1.76	102	-0.68	109	19.7	-0.1	115	423	86	78
77	10.107	0.131	0.077	1.73	102	-0.66	104	19.6	-0.1	115	425	86	78
78	10.240	0.133	0.075	1.77	102	-0.49	107	19.3	-0.3	115	427	86	79
79	10.375	0.135	0.094	1.76	102	-0.53	97	19.2	-0.1	115	430	86	79
80	10.504	0.129	0.086	1.76	102	-0.58	97	19.0	-0.2	116	434	86	78
81	10.641	0.137	0.086	1.78	102	-0.72	103	18.8	-0.2	116	435	86	78
82	10.772	0.131	0.085	1.77	102	-0.89	99	18.6	-0.2	116	438	86	78
83	10.904	0.132	0.078	1.76	102	-0.75	105	18.4	-0.2	117	440	86	79
84	11.039	0.135	0.083	1.75	102	-0.74	104	18.2	-0.2	117	443	86	78
85	11.171	0.132	0.086	1.78	102	-0.72	100	18.0	-0.2	117	445	86	78
86	11.303	0.132	0.084	1.76	102	-0.85	101	17.8	-0.2	117	448	86	78
87	11.437	0.134	0.087	1.73	102	-0.62	101	17.7	-0.1	118	450	86	79
88	11.569	0.132	0.083	1.72	103	-0.49	101	17.5	-0.2	118	451	86	78
89	11.701	0.132	0.084	1.73	103	-0.78	101	17.3	-0.2	118	450	86	79
90	11.836	0.135	0.080	1.73	103	-0.61	106	17.0	-0.3	118	451	86	79
91	11.966	0.130	0.075	1.74	103	-0.86	105	16.9	-0.1	118	450	86	79
92	12.101	0.135	0.079	1.74	103	-0.79	106	16.7	-0.2	118	450	86	79
93	12.234	0.133	0.082	1.76	103	-0.81	103	16.6	-0.1	118	450	86	79
94	12.364	0.130	0.077	1.72	103	-0.88	104	16.4	-0.2	118	449	86	78
95	12.501	0.137	0.085	1.77	103	-0.84	104	16.2	-0.2	119	447	86	79
96	12.631	0.130	0.077	1.74	103	-0.82	104	16.0	-0.2	119	447	86	79
97	12.763	0.132	0.077	1.75	103	-0.47	105	16.0	0	118	447	86	78
98	12.898	0.135	0.088	1.72	103	-0.72	101	15.7	-0.3	119	447	86	79

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	13.030	0.132	0.084	1.77	103	-0.73	101	15.5	-0.2	119	447	86	79
100	13.161	0.131	0.087	1.75	103	-0.66	98	15.3	-0.2	119	446	86	79
101	13.297	0.136	0.083	1.71	103	-0.96	104	15.1	-0.2	118	444	86	79
102	13.428	0.131	0.076	1.73	103	-0.58	105	15.0	-0.1	118	444	86	79
103	13.560	0.132	0.089	1.76	103	-0.8	98	14.8	-0.2	118	444	86	79
104	13.695	0.135	0.074	1.72	103	-0.63	110	14.6	-0.2	118	444	86	79
105	13.825	0.130	0.087	1.72	103	-0.72	97	14.5	-0.1	117	442	86	79
106	13.960	0.135	0.076	1.74	103	-0.56	108	14.3	-0.2	117	440	86	79
107	14.092	0.132	0.085	1.76	103	-0.68	100	14.1	-0.2	118	439	86	78
108	14.223	0.131	0.085	1.74	103	-0.97	99	14.0	-0.1	117	438	86	78
109	14.359	0.136	0.093	1.73	103	-0.9	99	13.8	-0.2	117	436	86	78
110	14.490	0.131	0.089	1.75	103	-0.73	97	13.8	0	117	435	86	78
111	14.623	0.133	0.089	1.74	103	-0.51	99	13.5	-0.3	117	433	86	78
112	14.757	0.134	0.078	1.74	103	-0.49	106	13.4	-0.1	117	432	86	78
113	14.889	0.132	0.075	1.77	103	-0.7	107	13.2	-0.2	117	432	86	78
114	15.021	0.132	0.079	1.73	103	-0.57	104	13.1	-0.1	116	430	86	78
115	15.156	0.135	0.081	1.72	103	-0.34	105	12.9	-0.2	117	429	86	79
116	15.286	0.130	0.078	1.72	103	-0.86	103	12.8	-0.1	116	429	86	79
117	15.419	0.133	0.084	1.72	103	-0.57	101	12.5	-0.3	117	428	86	79
118	15.554	0.135	0.081	1.77	103	-0.87	105	12.4	-0.1	116	427	86	79
119	15.683	0.129	0.081	1.74	103	-0.69	100	12.3	-0.1	116	426	86	79
120	15.819	0.136	0.089	1.75	103	-0.58	101	12.2	-0.1	116	423	86	79
121	15.951	0.132	0.085	1.76	103	-0.56	100	12.0	-0.2	116	421	86	79
122	16.082	0.131	0.082	1.70	103	-0.38	101	11.9	-0.1	115	418	86	79
123	16.217	0.135	0.081	1.75	103	-0.78	105	11.7	-0.2	115	417	86	79
124	16.348	0.131	0.077	1.73	103	-0.76	104	11.5	-0.2	115	416	86	79
125	16.481	0.133	0.091	1.75	103	-0.88	97	11.5	0	115	416	86	79
126	16.615	0.134	0.076	1.73	103	-0.57	107	11.3	-0.2	115	416	86	79
127	16.747	0.132	0.088	1.73	103	-0.58	98	11.2	-0.1	114	414	86	79
128	16.879	0.132	0.088	1.75	104	-0.58	98	11.0	-0.2	114	413	86	79
129	17.014	0.135	0.085	1.73	104	-0.46	102	11.0	0	114	412	86	79
130	17.144	0.130	0.089	1.75	104	-0.87	96	10.6	-0.4	114	411	86	79
131	17.278	0.134	0.072	1.74	104	-0.47	110	10.7	0.1	114	410	86	79

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	17.413	0.135	0.082	1.76	104	-0.79	104	10.6	-0.1	114	409	86	79
133	17.542	0.129	0.094	1.74	104	-0.9	93	10.5	-0.1	114	407	86	79
134	17.679	0.137	0.085	1.74	104	-0.52	103	10.4	-0.1	114	406	86	79
135	17.809	0.130	0.084	1.75	104	-0.44	99	10.2	-0.2	114	405	86	79
136	17.942	0.133	0.086	1.77	104	-0.5	100	10.1	-0.1	113	400	86	79
137	18.077	0.135	0.086	1.74	104	-0.61	101	9.9	-0.2	113	393	86	79
138	18.208	0.131	0.079	1.73	104	-0.75	102	9.9	0	112	388	86	79
139	18.340	0.132	0.076	1.74	104	-0.68	105	9.8	-0.1	112	384	86	78
140	18.475	0.135	0.090	1.74	104	-0.81	99	9.8	0	112	381	86	79
141	18.607	0.132	0.075	1.75	104	-0.5	106	9.6	-0.2	111	379	86	79
142	18.739	0.132	0.079	1.74	104	-0.53	103	9.5	-0.1	111	376	86	79
143	18.874	0.135	0.071	1.75	104	-0.69	111	9.5	0	111	375	86	79
144	19.004	0.130	0.081	1.74	104	-0.64	100	9.4	-0.1	110	374	86	79
145	19.140	0.136	0.087	1.75	104	-0.61	101	9.3	-0.1	110	370	86	79
146	19.272	0.132	0.078	1.74	104	-0.63	104	9.2	-0.1	109	365	86	79
147	19.402	0.130	0.089	1.75	104	-0.71	95	9.1	-0.1	109	360	86	79
148	19.538	0.136	0.084	1.74	104	-0.53	103	9.0	-0.1	108	358	86	79
149	19.668	0.130	0.087	1.74	104	-0.57	96	8.9	-0.1	108	356	86	79
150	19.801	0.133	0.083	1.75	104	-0.84	101	9.0	0.1	108	354	86	79
151	19.936	0.135	0.083	1.75	104	-0.63	103	8.8	-0.2	108	351	86	78
152	20.068	0.132	0.085	1.75	104	-0.84	99	8.7	-0.1	107	351	86	79
153	20.199	0.131	0.085	1.73	104	-0.6	98	8.8	0.1	107	349	86	78
154	20.335	0.136	0.079	1.75	104	-0.69	106	8.7	-0.1	106	348	86	78
155	20.465	0.130	0.072	1.75	104	-0.35	106	8.7	0	106	346	86	78
156	20.598	0.133	0.081	1.76	104	-0.75	102	8.5	-0.2	106	343	86	78
157	20.734	0.136	0.085	1.77	104	-0.64	102	8.4	-0.1	106	343	86	78
158	20.863	0.129	0.079	1.76	104	-0.51	100	8.5	0.1	106	342	86	78
159	20.999	0.136	0.082	1.75	104	-0.79	104	8.3	-0.2	105	339	86	78
160	21.131	0.132	0.079	1.77	104	-0.85	103	8.3	0	105	336	86	78
161	21.262	0.131	0.085	1.76	104	-0.49	98	8.2	-0.1	104	334	86	78
162	21.397	0.135	0.078	1.75	104	-0.64	105	8.2	0	104	330	85	78
163	21.528	0.131	0.077	1.73	104	-0.67	103	8.2	0	104	324	85	78
164	21.660	0.132	0.089	1.77	104	-0.68	96	8.2	0	103	318	85	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	21.794	0.134	0.088	1.74	104	-0.61	98	8.2	0	103	310	85	78
166	21.926	0.132	0.086	1.77	104	-0.65	98	8.0	-0.2	102	304	85	78
167	22.058	0.132	0.074	1.76	104	-0.6	106	8.1	0.1	102	298	85	78
168	22.193	0.135	0.076	1.72	104	-0.64	107	8.1	0	101	292	85	78
169	22.323	0.130	0.076	1.76	104	-0.67	103	7.9	-0.2	101	288	85	78
170	22.456	0.133	0.087	1.76	104	-0.41	98	8.0	0.1	100	281	85	78
171	22.591	0.135	0.083	1.77	104	-0.79	102	7.9	-0.1	99	274	85	78
172	22.719	0.128	0.078	1.75	104	-0.47	100	8.0	0.1	99	268	85	78
173	22.855	0.136	0.086	1.75	104	-0.64	101	8.0	0	99	264	85	77
174	22.987	0.132	0.077	1.76	104	-0.81	103	7.9	-0.1	98	259	85	78
175	23.118	0.131	0.082	1.75	104	-0.68	99	7.9	0	97	255	85	77
176	23.253	0.135	0.074	1.75	104	-0.69	108	7.9	0	97	253	85	77
177	23.384	0.131	0.081	1.74	104	-0.51	100	7.8	-0.1	97	249	85	77
178	23.517	0.133	0.074	1.79	104	-0.55	106	7.8	0	97	246	85	77
179	23.651	0.134	0.072	1.74	104	-0.79	108	7.8	0	96	244	85	77
180	23.782	0.131	0.079	1.76	104	-0.69	101	7.8	0	96	242	85	77
181	23.914	0.132	0.085	1.76	104	-0.82	98	7.7	-0.1	95	239	85	77
182	24.049	0.135	0.077	1.75	104	-0.78	105	7.7	0	95	237	85	77
183	24.179	0.130	0.080	1.74	104	-0.85	99	7.7	0	95	236	85	77
184	24.312	0.133	0.087	1.74	104	-0.47	98	7.5	-0.2	95	233	85	77
185	24.447	0.135	0.085	1.75	104	-0.4	100	7.6	0.1	94	232	85	77
186	24.576	0.129	0.079	1.75	104	-0.86	99	7.6	0	94	230	85	77
187	24.711	0.135	0.088	1.73	104	-0.9	98	7.6	0	94	228	85	77
188	24.843	0.132	0.078	1.71	104	-0.86	102	7.6	0	94	227	85	77
189	24.974	0.131	0.078	1.76	104	-0.93	101	7.7	0.1	94	226	85	77
190	25.109	0.135	0.087	1.74	104	-0.9	99	7.5	-0.2	93	224	85	77
191	25.240	0.131	0.088	1.74	104	-0.52	95	7.5	0	93	223	85	77
192	25.372	0.132	0.084	1.73	104	-0.67	98	7.6	0.1	93	222	85	76
193	25.507	0.135	0.087	1.75	104	-0.84	99	7.5	-0.1	93	221	85	77
194	25.638	0.131	0.080	1.74	104	-0.54	100	7.4	-0.1	92	220	85	77
195	25.769	0.131	0.076	1.75	104	-0.81	103	7.4	0	92	219	85	76
196	25.905	0.136	0.088	1.75	104	-0.65	99	7.4	0	92	218	85	76
197	26.035	0.130	0.081	1.76	104	-0.7	99	7.4	0	92	217	85	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	26.168	0.133	0.085	1.75	104	-0.81	98	7.3	-0.1	92	217	85	76
199	26.303	0.135	0.086	1.72	104	-0.6	99	7.3	0	92	216	85	76
200	26.432	0.129	0.083	1.73	104	-0.63	97	7.2	-0.1	92	215	85	76
201	26.567	0.135	0.075	1.74	104	-0.87	106	7.2	0	92	214	85	76
202	26.699	0.132	0.076	1.72	104	-0.78	103	7.4	0.2	91	214	85	76
203	26.830	0.131	0.082	1.75	104	-0.64	99	7.3	-0.1	91	213	85	76
204	26.966	0.136	0.083	1.77	104	-0.64	102	7.2	-0.1	91	212	84	76
205	27.096	0.130	0.084	1.73	104	-0.55	97	7.2	0	91	212	84	76
206	27.229	0.133	0.077	1.72	104	-0.5	103	7.2	0	91	212	84	76
207	27.363	0.134	0.080	1.74	104	-0.58	102	7.2	0	91	211	85	76
208	27.494	0.131	0.090	1.75	104	-0.79	94	7.1	-0.1	91	211	85	76
209	27.626	0.132	0.072	1.75	104	-0.65	106	7.1	0	91	210	85	76
210	27.761	0.135	0.086	1.73	104	-0.8	99	7.1	0	91	210	84	76
211	27.892	0.131	0.082	1.76	104	-0.71	99	7.0	-0.1	91	210	84	76
212	28.024	0.132	0.080	1.74	104	-0.75	101	7.1	0.1	91	209	84	76
213	28.159	0.135	0.086	1.73	104	-0.55	99	7.1	0	90	209	84	76
214	28.288	0.129	0.079	1.74	104	-0.81	99	7.0	-0.1	90	209	84	76
215	28.424	0.136	0.085	1.75	104	-0.87	100	7.0	0	90	208	84	76
216	28.556	0.132	0.087	1.73	104	-0.63	96	6.9	-0.1	90	208	84	76
217	28.686	0.130	0.087	1.76	104	-0.77	95	7.0	0.1	90	207	84	76
218	28.822	0.136	0.086	1.77	104	-0.37	100	7.0	0	90	207	84	76
219	28.952	0.130	0.073	1.77	104	-0.63	104	6.9	-0.1	90	207	84	76
220	29.085	0.133	0.078	1.73	104	-0.78	103	6.9	0	90	206	84	76
221	29.219	0.134	0.074	1.76	104	-0.76	106	6.9	0	90	206	84	76
222	29.351	0.132	0.088	1.69	104	-0.58	96	6.9	0	90	206	84	76
223	29.482	0.131	0.079	1.71	104	-0.98	100	6.9	0	90	205	84	76
224	29.617	0.135	0.081	1.73	104	-0.63	102	6.7	-0.2	89	205	84	75
225	29.748	0.131	0.072	1.74	104	-0.59	105	6.7	0	89	205	84	75
226	29.880	0.132	0.078	1.74	104	-0.61	102	6.8	0.1	89	204	84	75
227	30.015	0.135	0.073	1.74	104	-0.45	108	6.8	0	89	204	84	75
228	30.145	0.130	0.078	1.73	104	-0.56	100	6.8	0	89	204	84	75
229	30.279	0.134	0.085	1.74	104	-0.71	99	6.7	-0.1	89	204	84	75
230	30.412	0.133	0.080	1.74	103	-0.74	101	6.7	0	89	203	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	30.542	0.130	0.075	1.77	103	-0.42	102	6.6	-0.1	89	204	84	75
232	30.678	0.136	0.081	1.74	103	-0.41	103	6.6	0	89	203	84	75
233	30.808	0.130	0.076	1.74	103	-0.68	102	6.7	0.1	89	204	84	75
234	30.940	0.132	0.072	1.74	103	-0.53	106	6.6	-0.1	89	203	84	75
235	31.075	0.135	0.077	1.73	103	-0.55	105	6.6	0	89	203	84	75
236	31.206	0.131	0.076	1.74	103	-0.7	102	6.6	0	89	203	84	75
237	31.338	0.132	0.075	1.72	103	-0.72	104	6.6	0	89	203	84	75
238	31.473	0.135	0.080	1.73	103	-0.62	103	6.6	0	89	203	84	75
239	31.604	0.131	0.082	1.76	103	-0.47	99	6.5	-0.1	89	203	84	75
240	31.736	0.132	0.072	1.73	103	-0.74	106	6.5	0	88	203	84	75
241	31.871	0.135	0.084	1.74	103	-0.51	100	6.5	0	89	203	84	75
242	32.000	0.129	0.086	1.73	103	-0.53	95	6.5	0	89	203	84	75
243	32.135	0.135	0.073	1.74	103	-0.69	108	6.5	0	89	203	84	75
244	32.268	0.133	0.078	1.72	103	-0.5	103	6.4	-0.1	89	203	84	75
245	32.397	0.129	0.088	1.72	103	-0.46	94	6.4	0	88	203	84	75
246	32.533	0.136	0.087	1.72	103	-0.7	99	6.4	0	88	202	84	75
247	32.664	0.131	0.085	1.70	103	-0.46	97	6.4	0	88	203	84	75
248	32.795	0.131	0.081	1.73	103	-0.94	99	6.4	0	88	203	84	75
249	32.930	0.135	0.080	1.74	103	-0.99	103	6.3	-0.1	88	202	84	75
250	33.061	0.131	0.090	1.73	103	-0.53	94	6.3	0	88	203	84	75
251	33.193	0.132	0.081	1.72	103	-0.64	100	6.3	0	88	202	84	75
252	33.327	0.134	0.085	1.74	103	-0.74	99	6.3	0	88	203	84	75
253	33.459	0.132	0.086	1.72	103	-0.6	97	6.2	-0.1	88	203	84	75
254	33.590	0.131	0.086	1.76	103	-0.38	96	6.3	0.1	88	203	84	75
255	33.725	0.135	0.075	1.75	103	-0.81	106	6.2	-0.1	88	205	84	75
256	33.855	0.130	0.082	1.74	103	-0.75	98	6.2	0	88	205	84	75
257	33.988	0.133	0.084	1.73	103	-0.52	99	6.2	0	88	206	84	75
258	34.123	0.135	0.073	1.76	103	-0.64	108	6.1	-0.1	88	206	84	75
259	34.251	0.128	0.081	1.73	103	-0.93	97	6.1	0	88	206	84	75
260	34.387	0.136	0.092	1.75	103	-0.79	97	6.1	0	88	206	84	75
261	34.518	0.131	0.087	1.72	103	-0.64	96	6.1	0	88	206	84	75
262	34.649	0.131	0.082	1.73	103	-0.52	99	6.0	-0.1	88	206	84	75
263	34.784	0.135	0.069	1.72	103	-0.69	111	6.1	0.1	88	206	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	34.914	0.130	0.078	1.71	103	-0.86	100	6.1	0	88	206	84	74
265	35.046	0.132	0.086	1.71	103	-0.83	97	6.0	-0.1	88	206	84	75
266	35.181	0.135	0.083	1.72	103	-0.76	101	6.0	0	88	206	84	75
267	35.312	0.131	0.077	1.72	103	-0.62	102	6.0	0	88	206	84	75
268	35.443	0.131	0.080	1.71	103	-0.86	100	6.0	0	88	206	84	74
269	35.578	0.135	0.079	1.72	103	-0.88	103	6.0	0	88	206	84	75
270	35.709	0.131	0.082	1.73	103	-0.53	99	5.9	-0.1	88	205	84	75
271	35.840	0.131	0.076	1.72	103	-0.68	102	5.9	0	88	205	84	75
272	35.975	0.135	0.074	1.72	103	-0.76	107	5.8	-0.1	88	206	84	75
273	36.104	0.129	0.082	1.70	103	-0.76	97	5.9	0.1	88	205	84	74
274	36.238	0.134	0.080	1.70	103	-0.75	102	5.8	-0.1	88	206	84	74
275	36.372	0.134	0.081	1.73	103	-0.61	101	5.8	0	88	205	84	75
276	36.500	0.128	0.089	1.71	103	-0.55	92	5.7	-0.1	88	206	84	74
277	36.636	0.136	0.075	1.73	103	-0.71	107	5.8	0.1	88	206	84	74
278	36.767	0.131	0.075	1.72	103	-0.86	103	5.7	-0.1	88	206	84	74
279	36.898	0.131	0.087	1.70	103	-0.76	96	5.6	-0.1	88	206	84	74
280	37.033	0.135	0.081	1.74	103	-0.74	102	5.7	0.1	88	206	84	74
281	37.163	0.130	0.070	1.71	103	-0.87	106	5.7	0	88	206	84	74
282	37.295	0.132	0.082	1.70	103	-0.72	99	5.7	0	88	206	84	74
283	37.429	0.134	0.080	1.71	103	-0.49	102	5.7	0	88	206	84	74
284	37.560	0.131	0.089	1.73	103	-0.8	95	5.6	-0.1	88	206	84	74
285	37.691	0.131	0.073	1.73	103	-0.62	104	5.6	0	88	206	84	74
286	37.826	0.135	0.088	1.73	103	-0.67	98	5.6	0	88	206	84	74
287	37.957	0.131	0.083	1.72	103	-0.74	98	5.6	0	88	206	84	74
288	38.088	0.131	0.083	1.73	103	-0.8	98	5.4	-0.2	88	206	84	74
289	38.223	0.135	0.079	1.73	103	-0.65	103	5.5	0.1	88	206	84	74
290	38.351	0.128	0.079	1.71	103	-0.98	98	5.5	0	88	206	84	74
291	38.486	0.135	0.085	1.73	103	-0.45	100	5.5	0	88	206	84	74
292	38.619	0.133	0.088	1.71	103	-0.87	97	5.5	0	88	205	84	74
293	38.747	0.128	0.079	1.72	103	-0.8	98	5.5	0	88	205	84	74
294	38.883	0.136	0.076	1.71	103	-0.54	106	5.4	-0.1	87	206	84	74
295	39.014	0.131	0.082	1.72	103	-0.55	99	5.3	-0.1	88	206	84	74
296	39.144	0.130	0.088	1.69	103	-0.64	94	5.4	0.1	88	206	84	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	39.280	0.136	0.084	1.74	103	-0.54	101	5.5	0.1	87	206	84	74
298	39.409	0.129	0.076	1.69	103	-0.8	101	5.4	-0.1	87	206	84	74
299	39.541	0.132	0.077	1.73	103	-0.6	102	5.4	0	88	206	84	74
300	39.675	0.134	0.090	1.74	103	-0.55	96	5.3	-0.1	88	206	84	74
301	39.806	0.131	0.088	1.70	103	-0.72	95	5.3	0	87	207	84	74
302	39.937	0.131	0.082	1.75	103	-0.51	99	5.3	0	88	207	84	74
303	40.071	0.134	0.083	1.70	103	-0.78	100	5.3	0	87	207	84	74
304	40.202	0.131	0.088	1.72	103	-0.78	95	5.3	0	87	207	84	74
305	40.333	0.131	0.075	1.71	103	-0.73	103	5.2	-0.1	87	207	84	74
306	40.468	0.135	0.080	1.70	103	-0.59	103	5.2	0	87	207	84	74
307	40.597	0.129	0.081	1.72	103	-0.75	98	5.2	0	87	207	84	74
308	40.729	0.132	0.081	1.68	103	-0.78	100	5.2	0	87	208	84	74
309	40.864	0.135	0.072	1.69	103	-0.59	108	5.2	0	87	207	84	74
310	40.993	0.129	0.083	1.69	102	-0.7	97	5.1	-0.1	87	207	84	74
311	41.127	0.134	0.076	1.72	102	-0.75	105	5.1	0	87	207	84	74
312	41.259	0.132	0.082	1.71	102	-0.44	99	5.1	0	87	207	84	73
313	41.388	0.129	0.088	1.72	102	-0.54	94	5.1	0	87	207	84	74
314	41.524	0.136	0.076	1.70	103	-0.66	106	5.1	0	87	207	84	74
315	41.654	0.130	0.082	1.70	102	-0.66	98	4.9	-0.2	87	207	84	74
316	41.785	0.131	0.086	1.75	102	-0.54	96	5.0	0.1	87	207	84	74
317	41.919	0.134	0.078	1.72	102	-0.47	103	5.0	0	87	208	84	74
318	42.050	0.131	0.072	1.70	102	-0.8	105	4.9	-0.1	87	207	84	74
319	42.182	0.132	0.077	1.73	102	-0.64	103	5.0	0.1	87	208	84	73
320	42.315	0.133	0.085	1.74	102	-0.86	98	4.9	-0.1	87	208	84	74
321	42.446	0.131	0.076	1.74	102	-0.59	102	4.9	0	87	208	84	73
322	42.577	0.131	0.075	1.73	102	-0.46	103	4.9	0	87	208	84	74
323	42.711	0.134	0.089	1.74	102	-0.65	97	4.8	-0.1	87	208	84	73
324	42.841	0.130	0.072	1.75	102	-0.81	104	4.9	0.1	87	208	84	73
325	42.972	0.131	0.081	1.75	102	-0.9	99	4.8	-0.1	87	208	84	73
326	43.107	0.135	0.077	1.71	102	-0.63	105	4.8	0	87	208	84	73
327	43.236	0.129	0.078	1.72	102	-0.74	100	4.8	0	87	208	84	73
328	43.368	0.132	0.083	1.72	102	-0.54	99	4.8	0	87	208	84	73
329	43.502	0.134	0.082	1.74	102	-0.6	101	4.8	0	87	209	84	73

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	43.631	0.129	0.084	1.75	102	-0.78	96	4.7	-0.1	87	208	84	73
331	43.765	0.134	0.083	1.74	102	-0.83	100	4.7	0	87	208	84	73
332	43.897	0.132	0.086	1.73	102	-0.93	97	4.7	0	87	209	84	73
333	44.026	0.129	0.085	1.73	102	-0.94	95	4.7	0	87	209	84	73
334	44.161	0.135	0.078	1.75	102	-0.57	104	4.7	0	87	209	84	73
335	44.292	0.131	0.084	1.73	102	-0.86	97	4.6	-0.1	87	209	84	73
336	44.422	0.130	0.084	1.75	102	-0.85	97	4.6	0	87	209	84	73
337	44.557	0.135	0.077	1.75	102	-0.5	105	4.6	0	87	210	84	73
338	44.686	0.129	0.073	1.71	102	-0.64	103	4.6	0	87	210	84	73
339	44.817	0.131	0.083	1.73	102	-0.87	98	4.6	0	87	210	84	73
340	44.951	0.134	0.087	1.70	102	-0.87	98	4.6	0	87	210	84	73
341	45.082	0.131	0.084	1.73	102	-0.45	97	4.4	-0.2	87	210	84	73
342	45.213	0.131	0.082	1.73	102	-0.7	99	4.5	0.1	87	210	84	73
343	45.346	0.133	0.076	1.71	102	-0.86	104	4.5	0	87	210	84	73
344	45.477	0.131	0.079	1.69	102	-0.54	100	4.5	0	87	211	84	73
345	45.607	0.130	0.090	1.70	102	-0.66	93	4.5	0	87	210	84	73
346	45.741	0.134	0.074	1.70	102	-0.63	106	4.3	-0.2	87	210	84	73
347	45.871	0.130	0.072	1.71	102	-0.78	104	4.3	0	87	210	84	73
348	46.002	0.131	0.076	1.70	102	-0.95	102	4.4	0.1	87	210	84	73
349	46.136	0.134	0.090	1.70	102	-1.01	96	4.3	-0.1	87	210	84	73
350	46.265	0.129	0.086	1.71	102	-0.66	95	4.3	0	87	211	83	73
351	46.396	0.131	0.080	1.69	102	-0.55	100	4.3	0	87	211	83	73
352	46.531	0.135	0.083	1.71	102	-0.81	101	4.3	0	87	211	83	73
353	46.659	0.128	0.078	1.68	102	-0.73	99	4.2	-0.1	87	211	83	73
354	46.792	0.133	0.086	1.69	102	-0.74	98	4.3	0.1	87	211	83	73
355	46.925	0.133	0.087	1.73	102	-0.72	97	4.3	0	87	211	84	73
356	47.053	0.128	0.083	1.70	102	-0.85	96	4.2	-0.1	87	211	84	73
357	47.188	0.135	0.082	1.72	102	-0.59	102	4.2	0	87	211	84	73
358	47.318	0.130	0.085	1.73	102	-0.72	96	4.2	0	87	211	84	73
359	47.447	0.129	0.086	1.69	102	-0.58	95	4.2	0	87	211	84	73
360	47.582	0.135	0.088	1.71	102	-0.56	98	4.2	0	87	212	84	73
361	47.712	0.130	0.076	1.70	102	-0.75	102	4.1	-0.1	87	212	84	73
362	47.842	0.130	0.084	1.70	102	-0.61	97	4.2	0.1	87	212	84	73

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363	47.977	0.135	0.080	1.70	102	-0.54	103	4.0	-0.2	87	213	84	73
364	48.105	0.128	0.081	1.70	102	-0.61	97	4.1	0.1	87	212	84	73
365	48.236	0.131	0.084	1.70	102	-0.74	97	4.1	0	87	213	84	73
366	48.370	0.134	0.072	1.70	102	-0.66	108	4.0	-0.1	87	213	84	73
367	48.499	0.129	0.086	1.68	102	-0.42	95	3.9	-0.1	87	213	84	73
368	48.630	0.131	0.079	1.71	102	-0.78	100	4.0	0.1	87	213	84	73
369	48.763	0.133	0.091	1.72	102	-0.87	95	4.0	0	87	213	84	73
370	48.893	0.130	0.073	1.70	102	-0.69	104	3.8	-0.2	87	213	84	73
371	49.024	0.131	0.079	1.72	102	-0.59	100	3.9	0.1	86	212	84	73
372	49.157	0.133	0.090	1.71	102	-0.54	95	3.9	0	86	212	84	73
373	49.287	0.130	0.087	1.70	102	-0.69	95	3.9	0	86	212	84	72
374	49.417	0.130	0.081	1.69	102	-0.32	98	3.9	0	86	211	84	73
375	49.550	0.133	0.075	1.70	102	-0.59	105	3.9	0	86	211	83	73
376	49.680	0.130	0.082	1.71	102	-1.05	98	3.8	-0.1	86	211	84	73
377	49.810	0.130	0.084	1.68	102	-0.87	97	3.8	0	87	211	84	73
378	49.944	0.134	0.079	1.68	102	-0.78	103	3.8	0	87	210	84	72
379	50.074	0.130	0.074	1.67	102	-0.62	103	3.8	0	86	211	84	72
380	50.204	0.130	0.080	1.69	101	-0.67	99	3.8	0	86	210	84	72
381	50.338	0.134	0.082	1.66	101	-0.63	101	3.7	-0.1	86	210	83	72
382	50.467	0.129	0.071	1.69	101	-0.78	104	3.7	0	86	209	84	72
383	50.597	0.130	0.085	1.67	101	-0.78	96	3.7	0	86	209	83	72
384	50.731	0.134	0.087	1.69	101	-0.71	98	3.6	-0.1	86	209	83	72
385	50.859	0.128	0.081	1.66	101	-0.84	97	3.7	0.1	86	208	83	72
386	50.991	0.132	0.081	1.66	101	-0.45	100	3.6	-0.1	86	208	83	72
387	51.124	0.133	0.084	1.65	101	-0.54	99	3.7	0.1	86	208	83	72
388	51.252	0.128	0.077	1.65	101	-0.6	100	3.6	-0.1	86	208	83	72
389	51.385	0.133	0.079	1.65	101	-0.86	102	3.7	0.1	86	208	83	72
390	51.517	0.132	0.079	1.64	101	-0.75	101	3.5	-0.2	86	208	83	72
391	51.645	0.128	0.081	1.65	101	-0.8	97	3.5	0	86	208	83	72
392	51.778	0.133	0.089	1.64	101	-0.52	96	3.7	0.2	86	207	83	72
393	51.910	0.132	0.084	1.66	101	-0.72	98	3.6	-0.1	86	207	84	72
394	52.037	0.127	0.076	1.64	101	-0.52	99	3.5	-0.1	86	207	84	72
395	52.171	0.134	0.076	1.66	101	-0.84	105	3.5	0	86	207	83	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396	52.302	0.131	0.075	1.65	101	-0.88	103	3.5	0	86	207	83	72
397	52.430	0.128	0.072	1.65	101	-0.99	103	3.5	0	86	207	83	72
398	52.564	0.134	0.085	1.66	101	-0.91	99	3.5	0	86	207	83	72
399	52.694	0.130	0.083	1.66	101	-0.62	97	3.4	-0.1	86	207	83	72
400	52.822	0.128	0.086	1.67	101	-0.73	94	3.4	0	86	206	83	72
401	52.957	0.135	0.087	1.65	101	-0.72	99	3.4	0	86	206	83	72
402	53.087	0.130	0.082	1.65	101	-0.63	98	3.4	0	86	206	83	72
403	53.215	0.128	0.078	1.69	101	-0.78	99	3.3	-0.1	86	206	83	72
404	53.350	0.135	0.081	1.65	101	-0.67	102	3.3	0	86	205	83	72
405	53.479	0.129	0.080	1.67	101	-0.86	98	3.3	0	86	205	83	72
406	53.608	0.129	0.078	1.66	101	-0.61	100	3.3	0	86	206	83	72
407	53.742	0.134	0.083	1.68	101	-0.77	100	3.3	0	86	205	83	72
408	53.871	0.129	0.077	1.69	101	-0.76	100	3.3	0	86	205	83	72
409	54.000	0.129	0.078	1.66	101	-0.76	100	3.3	0	85	205	83	72
410	54.134	0.134	0.079	1.65	101	-0.82	103	3.2	-0.1	86	205	83	72
411	54.262	0.128	0.083	1.66	101	-0.77	96	3.2	0	85	205	83	72
412	54.392	0.130	0.079	1.67	101	-0.8	100	3.2	0	85	205	83	72
413	54.525	0.133	0.093	1.68	101	-0.65	94	3.2	0	85	205	83	72
414	54.654	0.129	0.085	1.66	101	-0.73	95	3.2	0	85	206	83	72
415	54.784	0.130	0.088	1.66	101	-0.98	94	3.1	-0.1	85	206	83	72
416	54.916	0.132	0.078	1.65	101	-0.53	102	3.1	0	85	206	83	72
417	55.045	0.129	0.082	1.66	101	-0.88	97	3.1	0	85	206	83	72
418	55.175	0.130	0.083	1.68	101	-0.52	97	3.1	0	85	207	83	72
419	55.308	0.133	0.083	1.68	101	-0.65	100	3.1	0	85	207	84	72
420	55.436	0.128	0.090	1.67	101	-0.81	92	3.0	-0.1	85	207	84	72
421	55.565	0.129	0.077	1.72	101	-0.73	100	3.1	0.1	85	207	84	72
422	55.698	0.133	0.078	1.68	101	-0.75	103	3.0	-0.1	85	206	84	72
423	55.827	0.129	0.081	1.70	101	-0.72	98	3.0	0	85	206	83	72
424	55.957	0.130	0.075	1.71	101	-0.56	102	3.0	0	85	206	83	72
425	56.089	0.132	0.090	1.71	101	-0.94	95	3.0	0	85	207	83	72
426	56.218	0.129	0.090	1.69	101	-0.66	93	3.0	0	85	207	83	72
427	56.348	0.130	0.080	1.68	101	-0.91	99	2.9	-0.1	85	206	83	72
428	56.481	0.133	0.075	1.69	101	-0.69	105	2.9	0	85	206	83	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
429	56.609	0.128	0.077	1.67	101	-0.78	99	2.9	0	85	206	83	72
430	56.739	0.130	0.077	1.68	101	-0.67	101	2.9	0	85	206	83	72
431	56.872	0.133	0.075	1.68	101	-0.95	105	2.9	0	85	207	83	72
432	57.001	0.129	0.082	1.67	101	-0.81	97	2.9	0	85	206	83	72
433	57.131	0.130	0.082	1.66	101	-0.7	98	2.8	-0.1	85	206	83	72
434	57.263	0.132	0.082	1.67	101	-0.82	99	2.7	-0.1	85	206	83	72
435	57.392	0.129	0.084	1.68	101	-0.49	96	2.8	0.1	85	205	83	71
436	57.522	0.130	0.074	1.67	100	-0.76	103	2.8	0	85	205	83	72
437	57.654	0.132	0.080	1.65	100	-0.54	101	2.7	-0.1	85	205	83	71
438	57.783	0.129	0.088	1.62	100	-0.74	94	2.7	0	85	205	83	72
439	57.913	0.130	0.076	1.66	101	-0.67	102	2.7	0	85	205	83	72
440	58.045	0.132	0.080	1.65	101	-0.62	101	2.7	0	85	205	83	71
441	58.174	0.129	0.080	1.63	100	-0.85	98	2.7	0	85	205	83	72
442	58.304	0.130	0.075	1.64	100	-0.71	103	2.7	0	85	205	83	72
443	58.437	0.133	0.081	1.65	100	-0.73	101	2.7	0	85	204	83	72
444	58.566	0.129	0.084	1.64	100	-0.89	96	2.6	-0.1	85	204	83	72
445	58.696	0.130	0.081	1.64	100	-0.78	99	2.6	0	85	204	83	72
446	58.828	0.132	0.080	1.66	100	-0.83	101	2.5	-0.1	85	204	83	72
447	58.957	0.129	0.086	1.64	100	-0.53	95	2.7	0.2	85	204	83	71
448	59.087	0.130	0.085	1.65	100	-0.8	96	2.5	-0.2	85	204	83	72
449	59.219	0.132	0.087	1.63	100	-0.49	97	2.6	0.1	85	204	83	72
450	59.348	0.129	0.073	1.66	100	-0.69	103	2.6	0	85	204	83	72
451	59.478	0.130	0.081	1.66	100	-0.94	99	2.5	-0.1	85	203	83	71
452	59.610	0.132	0.086	1.63	100	-0.56	97	2.5	0	85	203	83	71
453	59.739	0.129	0.086	1.64	100	-0.69	95	2.5	0	85	203	83	71
454	59.869	0.130	0.082	1.66	100	-0.69	98	2.5	0	85	203	83	71
455	60.001	0.132	0.085	1.65	100	-0.54	98	2.5	0	85	203	83	71
456	60.131	0.130	0.085	1.67	100	-0.8	96	2.5	0	85	202	83	72
457	60.260	0.129	0.086	1.67	100	-0.69	95	2.5	0	85	202	83	71
458	60.393	0.133	0.089	1.67	100	-0.79	96	2.4	-0.1	85	201	83	71
459	60.522	0.129	0.077	1.65	100	-0.58	100	2.4	0	85	201	83	72
460	60.651	0.129	0.083	1.66	100	-0.75	97	2.3	-0.1	85	200	83	72
461	60.784	0.133	0.075	1.67	100	-0.85	105	2.4	0.1	84	200	83	71

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
462	60.913	0.129	0.091	1.66	100	-0.79	92	2.4	0	84	200	83	71
463	61.043	0.130	0.085	1.66	100	-0.66	96	2.3	-0.1	85	200	83	72
464	61.175	0.132	0.082	1.69	100	-0.88	99	2.2	-0.1	84	200	83	71
465	61.304	0.129	0.082	1.67	100	-0.89	97	2.3	0.1	84	199	83	71
466	61.434	0.130	0.073	1.66	100	-0.7	104	2.3	0	84	199	83	71
467	61.566	0.132	0.080	1.68	100	-0.87	101	2.3	0	84	199	83	71
468	61.695	0.129	0.075	1.68	100	-0.71	102	2.2	-0.1	84	198	83	71
469	61.825	0.130	0.075	1.68	100	-0.64	102	2.3	0.1	84	199	83	71
470	61.957	0.132	0.082	1.69	100	-0.89	99	2.2	-0.1	84	199	83	71
471	62.086	0.129	0.085	1.68	100	-0.72	95	2.2	0	84	198	83	71
472	62.216	0.130	0.085	1.64	100	-0.8	96	2.2	0	84	198	83	71
473	62.348	0.132	0.083	1.68	100	-0.71	99	2.2	0	84	198	83	71
474	62.477	0.129	0.078	1.68	100	-0.55	100	2.2	0	84	198	83	71
475	62.606	0.129	0.088	1.69	100	-0.97	94	2.2	0	84	197	83	71
476	62.738	0.132	0.075	1.66	100	-0.61	104	2.1	-0.1	84	197	83	71
477	62.867	0.129	0.078	1.71	100	-0.71	100	2.1	0	84	197	83	71
478	62.997	0.130	0.089	1.69	100	-0.68	94	2.1	0	84	197	83	71
479	63.129	0.132	0.081	1.69	100	-0.87	100	2.1	0	84	196	83	71
480	63.258	0.129	0.075	1.69	100	-0.93	102	2.1	0	84	196	83	71
481	63.388	0.130	0.074	1.67	100	-0.51	103	2.1	0	84	195	83	71
482	63.520	0.132	0.095	1.68	100	-0.7	92	2.1	0	84	195	83	71
483	63.649	0.129	0.076	1.67	100	-0.7	101	2.1	0	84	195	83	71
484	63.779	0.130	0.083	1.66	100	-0.87	97	2.0	-0.1	84	195	83	71
485	63.911	0.132	0.091	1.68	100	-0.73	94	2.0	0	84	194	83	71
486	64.040	0.129	0.073	1.69	100	-0.51	103	2.0	0	84	195	83	71
487	64.170	0.130	0.082	1.68	100	-0.91	98	2.0	0	84	196	83	71
488	64.302	0.132	0.091	1.70	100	-0.76	94	2.0	0	84	196	83	71
489	64.431	0.129	0.078	1.67	100	-0.9	100	2.0	0	84	196	83	71
490	64.561	0.130	0.077	1.67	100	-0.84	101	2.0	0	84	197	83	71
491	64.693	0.132	0.082	1.68	100	-0.64	99	1.9	-0.1	84	197	83	71
492	64.822	0.129	0.079	1.68	100	-0.8	99	1.9	0	84	196	84	72
493	64.951	0.129	0.078	1.66	100	-0.83	100	1.9	0	84	196	84	72
494	65.084	0.133	0.085	1.69	100	-0.8	98	1.9	0	84	196	84	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
495	65.213	0.129	0.089	1.66	100	-0.38	93	1.9	0	84	196	84	72
496	65.342	0.129	0.075	1.66	100	-0.8	102	1.9	0	84	195	84	71
497	65.475	0.133	0.083	1.67	100	-0.59	100	1.9	0	84	195	84	72
498	65.604	0.129	0.082	1.67	100	-0.7	97	1.8	-0.1	84	194	83	72
499	65.733	0.129	0.077	1.69	100	-0.77	100	1.8	0	84	194	84	72
500	65.865	0.132	0.082	1.67	100	-0.83	99	1.8	0	84	194	83	72
501	65.994	0.129	0.084	1.68	100	-0.68	96	1.8	0	84	194	83	72
502	66.124	0.130	0.077	1.68	100	-0.77	101	1.8	0	84	194	83	72
503	66.256	0.132	0.077	1.67	100	-0.49	103	1.8	0	84	194	83	72
504	66.385	0.129	0.082	1.68	100	-0.75	97	1.8	0	84	194	83	72
505	66.515	0.130	0.084	1.69	100	-0.63	97	1.8	0	84	194	83	72
506	66.646	0.131	0.093	1.66	100	-0.62	93	1.7	-0.1	84	194	84	72
507	66.775	0.129	0.087	1.69	100	-0.47	94	1.7	0	84	193	84	72
508	66.905	0.130	0.083	1.69	100	-0.48	97	1.7	0	84	193	84	72
509	67.037	0.132	0.090	1.66	100	-0.72	95	1.7	0	84	193	83	72
510	67.166	0.129	0.084	1.69	100	-0.66	96	1.6	-0.1	84	192	83	72
511	67.296	0.130	0.095	1.70	100	-0.92	91	1.7	0.1	84	191	83	72
512	67.428	0.132	0.086	1.68	100	-0.77	97	1.7	0	84	191	83	72
513	67.557	0.129	0.085	1.68	100	-0.78	95	1.7	0	84	191	83	72
514	67.687	0.130	0.081	1.67	100	-0.96	99	1.7	0	84	191	83	72
515	67.819	0.132	0.082	1.66	100	-0.89	99	1.6	-0.1	84	191	83	72
516	67.948	0.129	0.087	1.68	100	-0.45	94	1.6	0	84	191	83	72
517	68.077	0.129	0.074	1.70	100	-0.73	102	1.6	0	84	191	83	72
518	68.209	0.132	0.083	1.69	100	-0.89	99	1.6	0	84	190	83	72
519	68.338	0.129	0.087	1.68	100	-0.53	94	1.5	-0.1	84	190	83	72
520	68.468	0.130	0.088	1.69	100	-0.61	95	1.6	0.1	84	190	83	72
521	68.600	0.132	0.088	1.68	100	-0.86	96	1.6	0	84	190	83	72
522	68.729	0.129	0.077	1.69	100	-0.61	100	1.6	0	84	190	83	72
523	68.859	0.130	0.078	1.69	100	-0.92	100	1.6	0	84	189	83	72
524	68.991	0.132	0.079	1.70	100	-0.8	101	1.5	-0.1	84	189	83	72
525	69.120	0.129	0.084	1.67	100	-0.78	96	1.5	0	84	189	83	72
526	69.249	0.129	0.086	1.68	100	-0.71	95	1.4	-0.1	84	189	83	72
527	69.381	0.132	0.086	1.68	100	-0.81	97	1.5	0.1	84	188	83	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
528	69.510	0.129	0.093	1.67	100	-0.57	91	1.5	0	83	188	83	72
529	69.640	0.130	0.076	1.70	100	-0.54	102	1.5	0	83	188	83	72
530	69.772	0.132	0.069	1.68	100	-0.57	108	1.4	-0.1	83	188	83	72
531	69.901	0.129	0.074	1.66	100	-0.97	102	1.4	0	83	187	83	72
532	70.031	0.130	0.079	1.70	100	-0.87	100	1.4	0	83	187	83	72
533	70.163	0.132	0.082	1.70	100	-0.85	99	1.4	0	83	187	83	72
534	70.291	0.128	0.084	1.67	100	-0.69	95	1.4	0	83	187	83	72
535	70.421	0.130	0.090	1.72	100	-0.66	93	1.4	0	83	187	83	72
536	70.554	0.133	0.082	1.68	100	-0.54	100	1.4	0	83	187	83	72
537	70.682	0.128	0.074	1.67	100	-0.86	101	1.2	-0.2	83	187	83	72
538	70.812	0.130	0.089	1.71	100	-0.43	94	1.2	0	84	187	83	72
539	70.944	0.132	0.077	1.67	100	-0.82	103	1.2	0	83	187	83	72
540	71.073	0.129	0.081	1.68	100	-0.84	98	1.3	0.1	83	187	83	72
541	71.202	0.129	0.076	1.67	100	-0.8	101	1.3	0	83	187	83	72
542	71.335	0.133	0.086	1.66	100	-0.57	98	1.3	0	83	187	84	72
543	71.463	0.128	0.087	1.69	100	-0.69	94	1.3	0	83	187	84	72
544	71.593	0.130	0.092	1.68	100	-0.75	92	1.3	0	83	187	83	72
545	71.726	0.133	0.074	1.67	100	-0.97	105	1.2	-0.1	83	188	83	72
546	71.854	0.128	0.080	1.68	100	-0.65	98	1.2	0	83	187	83	72
547	71.983	0.129	0.090	1.70	100	-0.69	93	1.0	-0.2	83	187	83	72
548	72.116	0.133	0.079	1.68	100	-0.67	102	1.2	0.2	83	188	83	72
549	72.244	0.128	0.074	1.68	100	-0.56	101	1.3	0.1	83	188	83	72
550	72.374	0.130	0.076	1.68	100	-0.72	102	1.2	-0.1	83	188	83	72
551	72.507	0.133	0.089	1.67	100	-0.58	96	1.2	0	83	188	83	72
552	72.634	0.127	0.082	1.68	100	-0.7	96	1.1	-0.1	83	188	83	72
553	72.764	0.130	0.078	1.65	100	-0.9	100	1.1	0	83	188	83	72
554	72.897	0.133	0.083	1.68	100	-0.52	100	1.1	0	83	188	83	72
555	73.025	0.128	0.074	1.68	100	-0.76	101	1.2	0.1	83	188	83	72
556	73.153	0.128	0.083	1.66	100	-0.87	96	1.1	-0.1	83	188	83	72
557	73.287	0.134	0.075	1.66	100	-0.78	105	1.0	-0.1	83	188	83	72
558	73.415	0.128	0.087	1.67	100	-0.44	94	1.1	0.1	83	188	84	72
559	73.543	0.128	0.079	1.67	100	-0.72	98	1.0	-0.1	83	187	83	72
560	73.677	0.134	0.070	1.66	100	-0.71	109	1.0	0	83	187	84	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
561	73.805	0.128	0.078	1.67	100	-0.75	99	0.9	-0.1	83	187	84	72
562	73.933	0.128	0.083	1.69	100	-0.93	96	1.0	0.1	83	187	84	72
563	74.066	0.133	0.075	1.69	100	-0.76	105	1.0	0	83	187	84	72
564	74.194	0.128	0.071	1.68	100	-0.52	104	1.0	0	83	187	84	72
565	74.322	0.128	0.083	1.66	100	-0.51	96	0.9	-0.1	83	187	83	72
566	74.455	0.133	0.089	1.68	100	-0.96	96	0.9	0	83	187	83	72
567	74.584	0.129	0.090	1.68	100	-0.98	93	0.9	0	83	187	83	72
568	74.711	0.127	0.086	1.67	100	-0.77	93	0.8	-0.1	83	187	83	72
569	74.845	0.134	0.080	1.66	100	-0.65	102	0.9	0.1	83	187	83	72
570	74.975	0.130	0.081	1.68	100	-0.51	98	0.9	0	83	188	83	72
571	75.101	0.126	0.082	1.66	100	-0.62	95	0.9	0	83	188	83	72
572	75.235	0.134	0.086	1.68	99	-0.75	99	0.9	0	83	188	83	72
573	75.365	0.130	0.083	1.67	100	-0.95	97	0.7	-0.2	83	188	84	72
574	75.491	0.126	0.079	1.66	100	-0.73	97	0.8	0.1	83	189	83	72
575	75.624	0.133	0.083	1.65	100	-0.75	100	0.8	0	83	189	83	72
576	75.755	0.131	0.076	1.67	100	-0.95	102	0.8	0	83	189	83	72
577	75.881	0.126	0.075	1.67	100	-0.62	99	0.8	0	83	189	83	72
578	76.013	0.132	0.084	1.66	100	-0.79	98	0.8	0	83	189	83	72
579	76.144	0.131	0.088	1.66	100	-0.81	95	0.8	0	83	189	83	72
580	76.271	0.127	0.075	1.68	100	-0.7	100	0.7	-0.1	83	189	84	72
581	76.403	0.132	0.076	1.65	100	-0.85	103	0.7	0	83	188	84	72
582	76.534	0.131	0.077	1.67	100	-0.55	102	0.7	0	83	188	84	72
583	76.660	0.126	0.085	1.69	100	-0.92	93	0.7	0	83	188	84	72
584	76.791	0.131	0.074	1.65	100	-0.75	104	0.7	0	83	188	84	72
585	76.923	0.132	0.078	1.64	100	-0.76	102	0.6	-0.1	83	188	84	72
586	77.050	0.127	0.078	1.65	100	-0.58	98	0.7	0.1	83	188	83	72
587	77.180	0.130	0.088	1.65	100	-0.65	94	0.7	0	83	188	83	72
588	77.313	0.133	0.073	1.69	100	-0.91	106	0.6	-0.1	83	188	83	72
589	77.440	0.127	0.077	1.65	100	-0.94	99	0.6	0	83	188	83	72
590	77.570	0.130	0.088	1.65	100	-0.91	94	0.6	0	83	188	84	72
591	77.703	0.133	0.072	1.65	100	-0.87	107	0.5	-0.1	83	188	84	72
592	77.830	0.127	0.087	1.67	100	-0.71	93	0.6	0.1	83	187	84	72
593	77.960	0.130	0.076	1.65	99	-0.89	102	0.6	0	83	187	83	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
594	78.092	0.132	0.082	1.66	99	-0.58	100	0.5	-0.1	83	187	83	72
595	78.220	0.128	0.082	1.67	99	-0.79	97	0.5	0	83	187	83	72
596	78.349	0.129	0.088	1.65	100	-0.56	94	0.6	0.1	83	187	83	72
597	78.482	0.133	0.090	1.64	99	-0.79	96	0.4	-0.2	83	187	84	72
598	78.609	0.127	0.081	1.66	100	-0.82	96	0.6	0.2	83	187	84	72
599	78.738	0.129	0.077	1.65	100	-0.94	100	0.5	-0.1	83	187	84	72
600	78.870	0.132	0.087	1.66	99	-0.59	97	0.5	0	83	187	84	72
601	78.999	0.129	0.075	1.67	100	-0.61	102	0.4	-0.1	83	187	84	72
602	79.127	0.128	0.080	1.64	100	-0.94	98	0.5	0.1	83	187	84	72
603	79.259	0.132	0.086	1.65	99	-0.76	97	0.4	-0.1	83	186	84	72
604	79.388	0.129	0.089	1.66	99	-0.98	93	0.4	0	83	187	84	72
605	79.517	0.129	0.089	1.66	100	-0.55	93	0.4	0	83	187	84	72
606	79.649	0.132	0.086	1.63	99	-0.56	97	0.4	0	83	187	84	72
607	79.778	0.129	0.087	1.67	99	-0.88	94	0.4	0	83	187	84	72
608	79.907	0.129	0.092	1.66	99	-0.96	92	0.4	0	83	187	84	72
609	80.038	0.131	0.088	1.65	99	-0.53	95	0.4	0	83	187	84	72
610	80.167	0.129	0.086	1.64	99	-1.02	95	0.3	-0.1	83	187	84	72
611	80.297	0.130	0.088	1.65	99	-0.65	95	0.3	0	83	186	84	72
612	80.428	0.131	0.074	1.65	99	-0.85	104	0.3	0	83	186	84	72
613	80.557	0.129	0.078	1.66	99	-0.53	100	0.3	0	83	186	84	72
614	80.686	0.129	0.088	1.66	99	-0.67	94	0.3	0	83	186	84	72
615	80.818	0.132	0.089	1.70	99	-0.67	96	0.3	0	83	186	84	72
616	80.946	0.128	0.083	1.65	99	-0.84	96	0.3	0	83	186	84	72
617	81.075	0.129	0.076	1.66	99	-0.54	101	0.3	0	83	186	84	72
618	81.207	0.132	0.084	1.65	99	-0.62	98	0.4	0.1	83	186	83	72
619	81.335	0.128	0.083	1.64	99	-0.57	96	0.3	-0.1	83	186	83	72
620	81.464	0.129	0.081	1.68	99	-0.88	98	0.2	-0.1	83	186	83	72
621	81.596	0.132	0.086	1.66	99	-1.02	97	0.3	0.1	83	186	83	72
622	81.724	0.128	0.079	1.68	99	-0.59	98	0.2	-0.1	83	186	83	72
623	81.853	0.129	0.085	1.66	99	-0.51	96	0.2	0	83	186	83	72
624	81.986	0.133	0.077	1.67	99	-0.61	104	0.2	0	83	185	83	72
625	82.114	0.128	0.091	1.68	99	-0.57	92	0.2	0	83	185	83	72
626	82.242	0.128	0.085	1.65	99	-0.85	95	0.2	0	83	185	83	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
627	82.376	0.134	0.082	1.69	99	-0.9	101	0.1	-0.1	83	185	83	72
628	82.504	0.128	0.091	1.71	99	-0.58	92	0.1	0	83	185	83	72
629	82.632	0.128	0.088	1.67	99	-0.71	93	0.1	0	83	185	83	72
630	82.765	0.133	0.086	1.64	99	-0.78	98	0.1	0	83	185	83	72
631	82.893	0.128	0.079	1.61	99	-0.73	98	0.1	0	83	185	83	72
632	83.021	0.128	0.081	1.65	99	-0.88	97	0.1	0	83	185	83	72
633	83.154	0.133	0.076	1.65	99	-0.84	104	0.1	0	83	185	83	72
634	83.283	0.129	0.081	1.66	99	-0.75	98	0.1	0	83	184	83	72
635	83.410	0.127	0.073	1.66	99	-0.62	102	0.0	-0.1	83	183	83	72
Avg/Tot	83.410	0.131	0.081	1.70	101	-0.71	100			94	259	84	74.5

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	0.000		0.00	102	-1		80	0.000	4.71	0.58
1	0.122	0.122	1.74	101	-2.57	108	80	-0.060	3.64	0.40
2	0.250	0.128	1.71	101	-3.21	108	80	-0.060	3.26	0.60
3	0.381	0.131	1.69	101	0	106	81	-0.050	4.46	0.62
4	0.510	0.129	1.69	100	-2.58	107	81	-0.060	4.50	0.67
5	0.638	0.128	1.70	100	0	108	81	-0.060	4.88	0.61
6	0.768	0.130	1.69	100	0	109	81	-0.060	6.54	0.73
7	0.898	0.130	1.70	100	0	107	81	-0.070	9.18	0.64
8	1.026	0.128	1.68	100	0	110	81	-0.070	11.35	0.61
9	1.158	0.132	1.78	100	0	107	81	-0.080	12.06	0.81
10	1.289	0.131	1.67	100	-2.05	111	81	-0.090	14.23	1.46
11	1.418	0.129	1.69	100	-2.64	105	81	-0.080	13.58	0.88
12	1.552	0.134	1.82	100	-3.22	111	81	-0.080	13.34	0.76
13	1.683	0.131	1.71	100	0	115	81	-0.090	14.01	0.94
14	1.812	0.129	1.76	100	-2.97	108	81	-0.070	13.75	0.87
15	1.946	0.134	1.76	100	0	109	81	-0.080	13.14	1.05
16	2.077	0.131	1.76	100	-0.4	101	81	-0.080	11.95	1.13
17	2.207	0.130	1.77	100	-0.5	113	81	-0.070	11.39	0.67
18	2.341	0.134	1.75	100	-0.72	115	81	-0.080	10.29	0.58
19	2.471	0.130	1.75	100	-2.75	112	81	-0.070	9.73	0.57
20	2.602	0.131	1.76	100	-3.21	111	81	-0.070	9.17	0.51
21	2.736	0.134	1.76	100	-3.1	112	81	-0.080	9.41	0.54
22	2.865	0.129	1.74	100	-1.27	113	81	-0.070	9.45	0.38
23	2.998	0.133	1.75	100	-0.1	114	81	-0.080	9.54	0.37
24	3.132	0.134	1.77	100	0	113	81	-0.060	9.44	0.40
25	3.260	0.128	1.75	100	-2.07	104	81	-0.070	9.59	0.37
26	3.393	0.133	1.75	100	-1.7	111	81	-0.070	9.51	0.36
27	3.525	0.132	1.76	101	0	104	81	-0.060	9.52	0.35
28	3.655	0.130	1.76	101	0	109	81	-0.060	9.38	0.35
29	3.789	0.134	1.76	101	-2.2	113	81	-0.070	9.43	0.37
30	3.920	0.131	1.76	101	-2.37	108	81	-0.060	9.30	0.38
31	4.051	0.131	1.75	101	-0.98	100	81	-0.070	9.31	0.37

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	4.184	0.133	1.75	101	-0.49	110	81	-0.070	9.28	0.33
33	4.314	0.130	1.75	101	-2.97	108	81	-0.060	9.35	0.35
34	4.446	0.132	1.76	101	-2.68	112	81	-0.070	9.36	0.35
35	4.579	0.133	1.76	101	-3.21	114	81	-0.060	9.16	0.37
36	4.710	0.131	1.75	101	-2.9	108	81	-0.060	9.25	0.32
37	4.841	0.131	1.75	101	0	108	81	-0.060	9.15	0.36
38	4.973	0.132	1.75	101	-3.08	106	81	-0.060	9.06	0.35
39	5.105	0.132	1.74	101	0	103	81	-0.060	9.17	0.36
40	5.235	0.130	1.74	101	-1.83	103	81	-0.060	9.05	0.39
41	5.370	0.135	1.76	102	-1.94	107	81	-0.060	9.12	0.37
42	5.500	0.130	1.76	102	-3.18	102	81	-0.060	9.22	0.36
43	5.630	0.130	1.75	102	-3.22	114	81	-0.070	9.30	0.37
44	5.765	0.135	1.75	102	0	105	81	-0.080	9.27	0.35
45	5.894	0.129	1.75	102	-2.59	101	81	-0.070	9.18	0.35
46	6.026	0.132	1.74	102	-1.77	106	81	-0.070	9.40	0.36
47	6.160	0.134	1.74	102	-0.55	115	81	-0.060	9.29	0.32
48	6.289	0.129	1.76	102	-1.62	111	81	-0.070	9.11	0.36
49	6.423	0.134	1.75	102	-3.21	105	81	-0.070	9.12	0.35
50	6.555	0.132	1.76	102	-3.27	107	81	-0.060	9.01	0.38
51	6.684	0.129	1.74	102	-3.1	109	80	-0.050	8.67	0.42
52	6.818	0.134	1.74	102	-0.11	112	80	-0.060	8.57	0.47
53	6.950	0.132	1.77	103	-1.61	102	81	-0.060	8.60	0.47
54	7.080	0.130	1.74	103	-2.86	101	81	-0.060	8.40	0.47
55	7.214	0.134	1.74	103	-0.33	112	80	-0.070	8.39	0.49
56	7.345	0.131	1.75	103	-1.93	101	81	-0.060	8.32	0.46
57	7.476	0.131	1.74	103	-2.99	107	81	-0.060	8.43	0.46
58	7.609	0.133	1.75	103	-0.04	114	80	-0.060	8.48	0.48
59	7.740	0.131	1.73	103	0	110	80	-0.060	8.42	0.46
60	7.871	0.131	1.76	103	-2.29	102	80	-0.060	8.56	0.45
61	8.004	0.133	1.75	103	0	107	80	-0.060	8.55	0.44
62	8.135	0.131	1.74	103	-0.63	106	81	-0.060	8.76	0.43
63	8.265	0.130	1.74	103	0	111	81	-0.060	8.89	0.40

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	8.400	0.135	1.75	103	-0.99	107	80	-0.050	9.15	0.40
65	8.531	0.131	1.74	103	-2.16	107	80	-0.060	9.00	0.38
66	8.661	0.130	1.75	103	-2.75	102	80	-0.060	9.27	0.36
67	8.795	0.134	1.75	103	-1.61	110	80	-0.070	9.35	0.36
68	8.925	0.130	1.74	103	-1.77	108	80	-0.060	9.49	0.33
69	9.056	0.131	1.73	103	-0.29	103	80	-0.070	9.63	0.30
70	9.190	0.134	1.74	103	-0.33	107	80	-0.070	9.82	0.33
71	9.319	0.129	1.74	104	-1.96	113	80	-0.060	10.00	0.30
72	9.452	0.133	1.74	104	-3.23	108	80	-0.070	10.28	0.29
73	9.585	0.133	1.74	104	-3.07	106	80	-0.070	10.36	0.32
74	9.714	0.129	1.73	104	-1.65	102	80	-0.070	10.40	0.35
75	9.848	0.134	1.74	104	-0.27	104	80	-0.070	10.57	0.29
76	9.980	0.132	1.79	104	0	111	80	-0.060	10.83	0.34
77	10.112	0.132	1.78	104	-0.39	110	80	-0.060	10.82	0.34
78	10.246	0.134	1.78	104	-3.05	113	80	-0.070	10.96	0.36
79	10.380	0.134	1.76	104	-3.1	101	80	-0.070	11.22	0.43
80	10.511	0.131	1.78	104	-0.21	103	80	-0.060	11.20	0.46
81	10.646	0.135	1.78	104	-3.26	106	80	-0.080	11.19	0.52
82	10.779	0.133	1.78	104	-1.96	105	80	-0.070	11.33	0.61
83	10.910	0.131	1.78	104	-0.41	108	80	-0.070	11.39	0.65
84	11.046	0.136	1.78	104	0	109	80	-0.070	11.37	0.77
85	11.177	0.131	1.78	104	-1.21	103	80	-0.070	11.75	0.84
86	11.311	0.134	1.78	104	-3.15	107	80	-0.070	11.98	0.93
87	11.444	0.133	1.76	104	-0.91	104	80	-0.070	11.73	0.96
88	11.575	0.131	1.77	104	0	105	81	-0.080	11.91	1.00
89	11.710	0.135	1.77	104	-2.27	108	81	-0.070	11.57	0.93
90	11.842	0.132	1.75	104	-0.48	108	81	-0.070	11.49	0.87
91	11.974	0.132	1.76	104	-0.55	112	81	-0.070	11.49	0.83
92	12.108	0.134	1.76	104	-3.27	110	80	-0.070	11.29	0.83
93	12.240	0.132	1.77	104	0	107	81	-0.070	11.48	0.75
94	12.371	0.131	1.76	104	-0.3	109	81	-0.060	11.38	0.75
95	12.506	0.135	1.76	104	-3.26	107	81	-0.070	11.46	0.75

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	12.638	0.132	1.77	104	-3.23	110	81	-0.070	11.44	0.75
97	12.769	0.131	1.75	104	0	109	81	-0.080	11.50	0.72
98	12.905	0.136	1.75	104	-3.18	106	81	-0.070	11.43	0.72
99	13.034	0.129	1.76	105	-1.06	103	81	-0.060	11.34	0.69
100	13.168	0.134	1.76	105	-0.09	105	81	-0.060	11.32	0.65
101	13.301	0.133	1.75	105	-3.13	107	81	-0.070	11.25	0.76
102	13.432	0.131	1.75	105	-2.78	110	80	-0.070	11.37	0.65
103	13.566	0.134	1.76	105	-0.05	104	80	-0.070	11.19	0.71
104	13.698	0.132	1.75	105	-0.96	112	80	-0.080	11.32	0.63
105	13.829	0.131	1.75	105	-0.06	103	81	-0.070	11.25	0.57
106	13.963	0.134	1.75	105	-0.21	112	81	-0.060	11.00	0.56
107	14.095	0.132	1.76	105	0	105	80	-0.060	10.93	0.56
108	14.226	0.131	1.76	105	-1.96	104	81	-0.050	11.01	0.51
109	14.360	0.134	1.75	105	-3.27	101	81	-0.060	10.86	0.48
110	14.493	0.133	1.76	105	0	103	81	-0.070	10.87	0.48
111	14.623	0.130	1.74	105	-3.1	101	81	-0.060	10.81	0.45
112	14.758	0.135	1.75	105	-3.21	112	80	-0.070	10.78	0.46
113	14.888	0.130	1.77	105	-3.06	110	81	-0.060	10.79	0.47
114	15.020	0.132	1.75	105	-3.21	108	81	-0.070	10.99	0.47
115	15.154	0.134	1.76	105	-3.2	109	81	-0.070	10.92	0.51
116	15.283	0.129	1.74	105	-0.88	107	81	-0.060	10.76	0.53
117	15.417	0.134	1.74	105	-0.38	107	81	-0.080	10.87	0.60
118	15.549	0.132	1.73	105	-3.3	107	81	-0.070	10.88	0.63
119	15.679	0.130	1.75	105	-2.69	105	81	-0.070	10.86	0.59
120	15.813	0.134	1.75	105	-0.58	104	81	-0.070	10.59	0.42
121	15.944	0.131	1.73	105	-0.51	104	81	-0.060	10.46	0.34
122	16.074	0.130	1.73	105	-0.03	105	81	-0.060	10.17	0.32
123	16.207	0.133	1.73	105	-3.03	108	81	-0.070	10.22	0.29
124	16.338	0.131	1.74	105	-0.44	109	81	-0.060	10.21	0.25
125	16.469	0.131	1.74	105	0	100	81	-0.070	10.26	0.25
126	16.602	0.133	1.74	105	-3.2	111	81	-0.070	10.31	0.29
127	16.733	0.131	1.73	105	-2.77	102	81	-0.060	10.11	0.27

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
128	16.864	0.131	1.74	105	-3.23	102	81	-0.060	10.04	0.27
129	16.996	0.132	1.73	105	-0.69	104	81	-0.070	9.97	0.20
130	17.128	0.132	1.73	105	-2.72	102	81	-0.070	9.89	0.21
131	17.258	0.130	1.74	105	-2.91	112	81	-0.050	10.01	0.17
132	17.392	0.134	1.74	105	-0.77	108	81	-0.060	9.91	0.20
133	17.523	0.131	1.74	105	-2.08	98	81	-0.060	9.74	0.21
134	17.652	0.129	1.74	105	-0.69	102	81	-0.070	9.47	0.28
135	17.787	0.135	1.72	105	-0.4	107	81	-0.070	9.52	0.25
136	17.916	0.129	1.73	105	0	101	81	-0.060	9.47	0.25
137	18.047	0.131	1.72	105	-0.57	103	81	-0.050	8.74	0.18
138	18.181	0.134	1.73	105	-3.22	110	81	-0.060	8.54	0.17
139	18.310	0.129	1.72	105	-0.03	108	80	-0.060	8.60	0.19
140	18.442	0.132	1.73	106	0	101	81	-0.050	8.17	0.18
141	18.576	0.134	1.73	106	-0.17	112	81	-0.060	8.18	0.20
142	18.704	0.128	1.71	106	-2.87	104	80	-0.070	8.15	0.17
143	18.837	0.133	1.73	106	0	114	80	-0.070	8.24	0.19
144	18.969	0.132	1.72	106	-1.73	106	80	-0.050	8.26	0.19
145	19.098	0.129	1.72	106	-2.86	100	80	-0.070	8.31	0.21
146	19.231	0.133	1.73	106	-1.07	109	80	-0.070	7.69	0.16
147	19.363	0.132	1.73	106	-2.9	101	80	-0.060	7.26	0.17
148	19.492	0.129	1.72	106	-2.99	102	80	-0.060	7.17	0.15
149	19.626	0.134	1.72	106	-0.14	104	80	-0.050	7.30	0.13
150	19.756	0.130	1.73	106	-0.04	103	80	-0.050	7.13	0.14
151	19.886	0.130	1.71	106	-1.05	103	80	-0.060	7.09	0.16
152	20.018	0.132	1.72	106	-3.35	103	80	-0.060	7.20	0.17
153	20.149	0.131	1.72	106	-2.66	103	80	-0.060	7.09	0.16
154	20.279	0.130	1.72	106	-3.34	106	80	-0.050	7.01	0.17
155	20.411	0.132	1.71	106	-3.22	112	80	-0.060	6.81	0.19
156	20.541	0.130	1.70	106	-0.17	104	80	-0.050	6.93	0.22
157	20.671	0.130	1.72	106	-0.28	102	80	-0.060	6.88	0.19
158	20.803	0.132	1.70	106	-2.33	107	80	-0.060	6.90	0.19
159	20.933	0.130	1.71	106	-3.12	104	80	-0.050	6.88	0.18

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
160	21.063	0.130	1.70	106	-0.26	105	80	-0.050	6.52	0.21
161	21.195	0.132	1.69	106	-3.31	103	80	-0.050	6.38	0.19
162	21.324	0.129	1.68	106	-2.05	105	80	-0.050	6.48	0.19
163	21.453	0.129	1.69	106	-2.94	106	80	-0.050	5.92	0.25
164	21.584	0.131	1.69	106	-0.58	100	80	-0.040	5.66	0.33
165	21.713	0.129	1.68	106	-2.13	99	80	-0.040	5.31	0.50
166	21.843	0.130	1.68	106	-2.13	101	80	-0.040	5.24	0.60
167	21.974	0.131	1.70	106	-1.44	110	80	-0.040	5.02	0.64
168	22.103	0.129	1.69	106	-0.12	106	80	-0.040	4.95	0.64
169	22.233	0.130	1.70	106	-2.33	107	80	-0.050	4.98	0.73
170	22.364	0.131	1.67	106	-1.32	101	80	-0.050	4.86	0.73
171	22.494	0.130	1.70	106	-3.38	102	80	-0.040	4.48	1.12
172	22.623	0.129	1.69	106	-2.56	105	80	-0.050	4.44	1.15
173	22.755	0.132	1.70	106	-2.57	102	80	-0.040	4.53	1.14
174	22.884	0.129	1.69	106	-3.39	105	80	-0.040	4.48	1.17
175	23.013	0.129	1.69	106	-0.12	102	80	-0.040	4.48	1.13
176	23.145	0.132	1.69	106	-0.55	110	80	-0.040	4.54	0.94
177	23.275	0.130	1.70	106	-0.08	103	80	-0.040	4.60	0.92
178	23.403	0.128	1.68	106	-0.09	107	80	-0.040	4.56	0.91
179	23.535	0.132	1.69	106	-1.62	111	80	-0.040	4.58	0.92
180	23.665	0.130	1.69	106	-0.12	105	80	-0.030	4.77	0.89
181	23.793	0.128	1.69	106	-0.53	99	80	-0.040	4.64	0.89
182	23.926	0.133	1.70	106	-0.1	108	80	-0.040	4.68	0.90
183	24.055	0.129	1.69	106	-1.7	103	81	-0.040	4.66	0.89
184	24.184	0.129	1.69	106	-3.34	99	81	-0.040	4.61	0.87
185	24.316	0.132	1.67	106	-0.34	102	81	-0.040	4.65	0.94
186	24.445	0.129	1.70	106	-0.13	104	81	-0.030	4.52	0.91
187	24.574	0.129	1.69	106	-3.05	98	81	-0.040	4.70	0.91
188	24.705	0.131	1.68	106	-0.2	106	81	-0.030	4.67	0.88
189	24.835	0.130	1.68	106	-3.4	105	81	-0.040	4.73	0.88
190	24.963	0.128	1.68	106	-0.81	98	81	-0.040	4.72	0.87
191	25.096	0.133	1.69	106	-3.12	101	81	-0.040	4.62	0.87

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
192	25.225	0.129	1.69	106	-2.28	100	81	-0.020	4.69	0.87
193	25.354	0.129	1.69	106	-3.36	99	81	-0.040	4.74	0.83
194	25.485	0.131	1.69	106	-0.48	104	82	-0.030	4.79	0.82
195	25.616	0.131	1.70	106	-3.34	107	82	-0.030	4.73	0.81
196	25.743	0.127	1.69	106	-0.07	97	81	-0.030	4.79	0.78
197	25.876	0.133	1.69	106	-1.11	105	82	-0.040	4.80	0.81
198	26.006	0.130	1.69	106	-0.2	101	82	-0.040	4.77	0.80
199	26.134	0.128	1.69	106	-2.92	98	82	-0.030	4.80	0.82
200	26.266	0.132	1.69	106	-0.72	103	82	-0.040	4.81	0.80
201	26.397	0.131	1.69	106	-0.66	108	82	-0.040	4.79	0.79
202	26.524	0.127	1.68	106	-0.41	104	82	-0.040	4.73	0.78
203	26.656	0.132	1.69	106	-3.3	104	82	-0.030	4.82	0.82
204	26.787	0.131	1.69	106	-2.83	102	82	-0.040	4.77	0.81
205	26.914	0.127	1.68	106	-0.65	99	82	-0.040	4.75	0.78
206	27.045	0.131	1.68	106	-3.23	106	82	-0.040	4.81	0.78
207	27.177	0.132	1.69	106	-0.59	105	82	-0.030	4.69	0.78
208	27.305	0.128	1.69	106	-1.43	96	82	-0.040	4.82	0.78
209	27.435	0.130	1.68	106	-0.55	109	82	-0.030	4.71	0.76
210	27.567	0.132	1.69	106	-2.86	101	82	-0.040	4.74	0.77
211	27.695	0.128	1.69	106	-0.46	101	82	-0.040	4.72	0.80
212	27.825	0.130	1.69	106	-0.65	104	82	-0.040	4.85	0.79
213	27.957	0.132	1.67	106	-0.81	101	82	-0.040	4.81	0.77
214	28.084	0.127	1.68	106	-0.08	102	82	-0.040	4.75	0.76
215	28.214	0.130	1.69	106	-0.86	100	82	-0.030	4.78	0.78
216	28.346	0.132	1.69	106	-3.33	101	82	-0.050	4.81	0.78
217	28.474	0.128	1.70	106	-2.62	98	82	-0.030	4.80	0.79
218	28.604	0.130	1.68	106	-1.92	100	82	-0.030	4.76	0.77
219	28.736	0.132	1.70	106	-2.7	110	82	-0.030	4.93	0.77
220	28.864	0.128	1.69	106	-3.01	103	82	-0.030	4.79	0.76
221	28.993	0.129	1.70	106	-0.05	107	82	-0.030	4.92	0.77
222	29.126	0.133	1.68	106	-0.13	101	82	-0.030	4.79	0.76
223	29.254	0.128	1.67	106	-2.16	102	82	-0.030	4.87	0.76

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
224	29.383	0.129	1.68	106	-3.21	102	82	-0.040	4.80	0.74
225	29.515	0.132	1.68	106	-0.02	111	82	-0.040	4.86	0.74
226	29.644	0.129	1.68	106	-0.58	104	82	-0.030	4.86	0.74
227	29.772	0.128	1.69	106	-1.87	107	82	-0.030	4.83	0.74
228	29.904	0.132	1.68	106	-0.35	106	82	-0.040	4.92	0.74
229	30.033	0.129	1.69	106	-0.14	99	82	-0.040	4.82	0.73
230	30.161	0.128	1.68	106	-0.54	102	82	-0.020	4.82	0.75
231	30.293	0.132	1.67	106	-0.15	108	82	-0.040	4.97	0.72
232	30.422	0.129	1.68	106	-2.79	102	82	-0.030	4.92	0.73
233	30.550	0.128	1.69	106	-3.08	104	82	-0.030	5.00	0.74
234	30.682	0.132	1.68	106	-3.32	111	82	-0.030	4.98	0.76
235	30.811	0.129	1.68	106	-3.34	105	82	-0.040	4.93	0.73
236	30.940	0.129	1.68	106	-2.69	105	82	-0.020	4.85	0.72
237	31.071	0.131	1.68	106	-0.08	108	82	-0.030	4.92	0.72
238	31.200	0.129	1.68	105	-0.06	103	82	-0.040	4.86	0.71
239	31.329	0.129	1.69	105	-3.01	101	82	-0.030	5.01	0.73
240	31.460	0.131	1.68	105	-0.45	110	82	-0.030	4.94	0.72
241	31.589	0.129	1.68	105	-1.69	100	82	-0.030	5.02	0.72
242	31.717	0.128	1.68	105	-0.98	98	82	-0.040	5.03	0.70
243	31.848	0.131	1.68	105	-3.38	109	82	-0.030	5.00	0.73
244	31.976	0.128	1.67	105	-3.3	103	82	-0.040	5.03	0.72
245	32.105	0.129	1.67	105	-1.08	98	82	-0.030	4.99	0.74
246	32.236	0.131	1.67	105	-3.45	100	82	-0.040	4.91	0.74
247	32.365	0.129	1.67	105	-2.53	100	82	-0.030	5.00	0.73
248	32.493	0.128	1.66	105	-3.31	101	82	-0.030	5.05	0.75
249	32.624	0.131	1.66	105	-0.63	104	82	-0.040	4.89	0.75
250	32.753	0.129	1.66	105	-3.24	97	82	-0.030	4.91	0.73
251	32.880	0.127	1.67	105	-3.37	100	82	-0.020	4.91	0.74
252	33.011	0.131	1.67	105	-2.77	101	82	-0.030	4.98	0.74
253	33.141	0.130	1.66	105	-0.47	100	82	-0.040	5.10	0.73
254	33.268	0.127	1.67	105	-2.39	97	82	-0.030	5.14	0.76
255	33.398	0.130	1.66	105	-1.68	107	82	-0.030	4.89	0.78

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
256	33.529	0.131	1.63	105	-3.44	103	82	-0.030	4.93	0.78
257	33.655	0.126	1.66	105	-2.92	98	82	-0.030	4.93	0.77
258	33.784	0.129	1.65	105	-0.48	107	82	-0.030	5.12	0.74
259	33.916	0.132	1.67	105	-0.81	104	82	-0.030	5.01	0.72
260	34.043	0.127	1.66	105	-2.62	94	82	-0.020	5.00	0.71
261	34.171	0.128	1.67	105	-3.21	98	82	-0.030	5.04	0.70
262	34.302	0.131	1.66	105	-0.06	103	82	-0.030	5.07	0.71
263	34.431	0.129	1.67	105	-0.95	111	82	-0.030	5.08	0.71
264	34.558	0.127	1.66	105	-3.44	102	82	-0.040	5.09	0.71
265	34.688	0.130	1.67	105	-0.14	100	82	-0.030	5.14	0.69
266	34.817	0.129	1.65	105	-0.65	101	82	-0.040	5.14	0.69
267	34.945	0.128	1.67	105	-0.14	104	82	-0.030	5.08	0.68
268	35.075	0.130	1.65	105	-1.63	103	82	-0.030	5.10	0.70
269	35.203	0.128	1.66	105	-2.84	102	82	-0.030	5.20	0.67
270	35.331	0.128	1.65	105	-3.38	101	82	-0.030	5.08	0.68
271	35.462	0.131	1.66	105	-3.37	107	82	-0.030	5.13	0.67
272	35.590	0.128	1.66	105	-3.38	106	82	-0.040	5.21	0.71
273	35.717	0.127	1.66	105	-3.44	100	82	-0.030	5.14	0.67
274	35.847	0.130	1.64	105	-0.16	103	82	-0.040	5.20	0.66
275	35.976	0.129	1.65	105	-2.64	102	82	-0.040	5.12	0.65
276	36.102	0.126	1.66	105	-0.84	95	82	-0.030	5.08	0.66
277	36.232	0.130	1.66	105	-3.32	107	82	-0.030	5.21	0.69
278	36.362	0.130	1.65	105	-3.4	107	82	-0.040	5.23	0.68
279	36.489	0.127	1.65	105	-3.35	97	82	-0.030	5.21	0.68
280	36.616	0.127	1.66	105	-1.39	100	83	-0.040	5.12	0.69
281	36.747	0.131	1.65	105	-3.29	111	83	-0.030	5.17	0.68
282	36.875	0.128	1.64	105	-3.44	101	83	-0.030	5.28	0.68
283	37.002	0.127	1.65	105	-0.25	101	83	-0.030	5.18	0.65
284	37.132	0.130	1.66	105	-1.12	98	83	-0.040	5.27	0.67
285	37.260	0.128	1.64	105	-3	107	83	-0.040	5.20	0.65
286	37.387	0.127	1.62	105	-0.21	96	83	-0.030	5.20	0.65
287	37.517	0.130	1.65	105	-2.78	102	83	-0.030	5.21	0.64

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
288	37.644	0.127	1.65	105	-0.96	99	83	-0.030	5.24	0.64
289	37.771	0.127	1.64	105	-2.48	102	83	-0.040	5.17	0.65
290	37.901	0.130	1.64	105	-0.27	104	83	-0.030	5.36	0.66
291	38.030	0.129	1.65	105	-0.78	100	83	-0.030	5.34	0.67
292	38.156	0.126	1.64	105	-1.98	96	83	-0.030	5.25	0.66
293	38.285	0.129	1.64	105	-0.17	103	83	-0.020	5.14	0.65
294	38.414	0.129	1.65	105	-0.18	105	83	-0.040	5.28	0.65
295	38.540	0.126	1.64	105	-0.43	99	83	-0.030	5.37	0.63
296	38.667	0.127	1.63	105	-3.42	96	83	-0.050	5.36	0.65
297	38.797	0.130	1.64	105	-2.68	101	83	-0.030	5.25	0.66
298	38.925	0.128	1.62	105	-0.11	104	83	-0.040	5.25	0.64
299	39.052	0.127	1.64	105	-3.34	103	83	-0.030	5.24	0.65
300	39.180	0.128	1.63	105	-3.41	96	83	-0.030	5.41	0.66
301	39.307	0.127	1.63	105	-1.93	96	83	-0.030	5.27	0.64
302	39.434	0.127	1.62	105	-0.72	100	83	-0.030	5.25	0.65
303	39.563	0.129	1.63	105	-3.14	101	83	-0.030	5.27	0.65
304	39.691	0.128	1.64	105	-3.07	97	83	-0.040	5.26	0.61
305	39.817	0.126	1.63	105	-0.12	103	83	-0.040	5.24	0.61
306	39.944	0.127	1.63	105	-3.24	101	83	-0.030	5.35	0.60
307	40.074	0.130	1.64	105	-0.33	103	83	-0.030	5.23	0.60
308	40.200	0.126	1.62	105	-1.33	100	83	-0.040	5.32	0.62
309	40.326	0.126	1.61	105	-0.41	106	83	-0.030	5.25	0.58
310	40.455	0.129	1.63	105	-3.36	101	83	-0.030	5.28	0.56
311	40.582	0.127	1.63	105	-3.24	104	83	-0.040	5.30	0.62
312	40.708	0.126	1.62	105	-0.21	99	83	-0.030	5.16	0.59
313	40.838	0.130	1.62	105	-0.93	99	83	-0.030	5.32	0.59
314	40.964	0.126	1.62	105	-1.02	103	83	-0.020	5.25	0.60
315	41.089	0.125	1.61	105	-3.15	98	83	-0.040	5.21	0.59
316	41.218	0.129	1.62	105	-3.5	99	83	-0.030	5.27	0.59
317	41.346	0.128	1.62	105	-2.17	103	83	-0.030	5.28	0.58
318	41.472	0.126	1.62	105	-0.18	106	83	-0.030	5.30	0.60
319	41.598	0.126	1.61	105	-1.98	102	83	-0.040	5.35	0.61

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
320	41.726	0.128	1.62	105	-2.68	99	83	-0.040	5.32	0.59
321	41.853	0.127	1.61	105	-0.18	104	83	-0.030	5.36	0.56
322	41.979	0.126	1.61	105	-1.37	103	83	-0.040	5.31	0.59
323	42.108	0.129	1.61	105	-0.19	97	83	-0.040	5.23	0.57
324	42.234	0.126	1.61	104	-0.61	106	83	-0.030	5.33	0.57
325	42.359	0.125	1.61	104	-2.01	99	83	-0.030	5.29	0.57
326	42.486	0.127	1.60	104	-3.42	103	83	-0.030	5.34	0.59
327	42.615	0.129	1.60	104	-2.49	104	83	-0.040	5.16	0.57
328	42.740	0.125	1.59	104	-2.08	98	83	-0.030	5.31	0.55
329	42.865	0.125	1.62	104	-0.15	98	83	-0.030	5.36	0.58
330	42.994	0.129	1.62	104	-2.54	100	83	-0.030	5.31	0.60
331	43.119	0.125	1.60	104	-3.49	98	83	-0.030	5.23	0.57
332	43.245	0.126	1.59	104	-1.6	97	83	-0.030	5.24	0.57
333	43.373	0.128	1.60	104	-0.78	99	83	-0.040	5.32	0.60
334	43.500	0.127	1.61	104	-3.13	102	83	-0.030	5.28	0.58
335	43.624	0.124	1.60	104	-0.37	96	83	-0.030	5.37	0.57
336	43.750	0.126	1.60	104	-3	98	84	-0.030	5.28	0.58
337	43.877	0.127	1.60	104	-3.43	103	83	-0.040	5.31	0.59
338	44.004	0.127	1.60	104	-0.23	106	84	-0.040	5.31	0.58
339	44.128	0.124	1.58	104	-3.43	97	84	-0.030	5.24	0.56
340	44.257	0.129	1.58	104	-1.12	98	84	-0.040	5.28	0.58
341	44.382	0.125	1.60	104	-2.13	97	84	-0.040	5.40	0.58
342	44.506	0.124	1.59	104	-0.62	98	84	-0.030	5.42	0.57
343	44.632	0.126	1.58	104	-2.32	103	84	-0.030	5.29	0.57
344	44.760	0.128	1.58	104	-0.46	103	84	-0.030	5.32	0.58
345	44.885	0.125	1.58	104	-2.84	94	84	-0.040	5.38	0.59
346	45.010	0.125	1.60	104	-0.75	103	84	-0.040	5.36	0.56
347	45.137	0.127	1.59	104	-3.22	107	84	-0.030	5.39	0.56
348	45.263	0.126	1.59	104	-2.92	103	84	-0.040	5.34	0.55
349	45.386	0.123	1.58	104	-0.2	92	84	-0.030	5.48	0.55
350	45.511	0.125	1.57	104	-3.27	96	84	-0.050	5.38	0.54
351	45.638	0.127	1.56	104	-1.11	101	84	-0.030	5.37	0.56

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
352	45.763	0.125	1.58	104	-0.14	98	84	-0.030	5.48	0.54
353	45.887	0.124	1.58	104	-0.33	100	84	-0.040	5.39	0.53
354	46.014	0.127	1.57	104	-3.5	98	84	-0.030	5.46	0.56
355	46.140	0.126	1.57	104	-0.26	96	84	-0.040	5.36	0.57
356	46.263	0.123	1.58	104	-0.93	96	84	-0.030	5.39	0.53
357	46.387	0.124	1.56	104	-3.08	98	84	-0.040	5.43	0.53
358	46.514	0.127	1.56	104	-3.59	98	84	-0.040	5.51	0.56
359	46.638	0.124	1.56	104	-2.98	95	84	-0.030	5.46	0.54
360	46.762	0.124	1.57	104	-1.21	94	84	-0.040	5.42	0.57
361	46.887	0.125	1.54	104	-1.42	102	84	-0.040	5.39	0.59
362	47.014	0.127	1.55	104	-0.61	99	84	-0.040	5.42	0.61
363	47.137	0.123	1.55	104	-3.01	98	84	-0.030	5.39	0.59
364	47.261	0.124	1.55	104	-3.5	98	84	-0.040	5.34	0.57
365	47.387	0.126	1.54	104	-2.08	98	84	-0.040	5.55	0.58
366	47.511	0.124	1.56	104	-2.72	104	84	-0.030	5.41	0.56
367	47.633	0.122	1.53	104	-0.22	94	84	-0.040	5.42	0.60
368	47.758	0.125	1.56	104	-1.95	100	84	-0.040	5.36	0.58
369	47.883	0.125	1.55	104	-0.38	93	84	-0.030	5.36	0.60
370	48.006	0.123	1.54	104	-3.48	103	84	-0.030	5.44	0.59
371	48.129	0.123	1.54	104	-0.95	98	84	-0.020	5.31	0.61
372	48.254	0.125	1.54	104	-0.92	94	84	-0.030	5.23	0.64
373	48.380	0.126	1.54	104	-0.27	96	84	-0.030	5.14	0.63
374	48.503	0.123	1.54	104	-3.17	97	84	-0.040	5.16	0.61
375	48.625	0.122	1.53	104	-2.44	100	84	-0.030	5.09	0.61
376	48.750	0.125	1.54	104	-2.08	98	84	-0.040	5.03	0.60
377	48.875	0.125	1.52	104	-0.57	97	84	-0.040	5.00	0.58
378	48.998	0.123	1.54	104	-0.3	99	84	-0.040	5.09	0.59
379	49.120	0.122	1.53	104	-0.31	101	84	-0.040	5.10	0.60
380	49.245	0.125	1.54	104	-3.52	99	84	-0.040	5.19	0.58
381	49.368	0.123	1.53	104	-3.5	97	84	-0.050	5.21	0.59
382	49.490	0.122	1.54	104	-0.38	103	84	-0.030	5.11	0.60
383	49.613	0.123	1.52	104	-2.58	95	84	-0.030	5.03	0.58

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
384	49.738	0.125	1.54	104	-2.78	95	84	-0.020	5.06	0.62
385	49.861	0.123	1.51	104	-2.98	97	84	-0.030	5.05	0.61
386	49.983	0.122	1.52	104	-3.56	96	84	-0.030	5.05	0.59
387	50.106	0.123	1.52	104	-0.61	95	84	-0.030	5.08	0.60
388	50.231	0.125	1.53	104	-2.96	101	84	-0.030	5.04	0.59
389	50.353	0.122	1.51	104	-0.43	98	84	-0.040	5.14	0.58
390	50.475	0.122	1.52	104	-3.49	98	84	-0.030	5.08	0.60
391	50.598	0.123	1.52	104	-0.42	97	84	-0.040	5.04	0.61
392	50.723	0.125	1.53	103	-0.53	94	84	-0.020	5.08	0.59
393	50.845	0.122	1.52	104	-1.59	95	84	-0.040	5.05	0.58
394	50.967	0.122	1.51	103	-0.37	100	84	-0.040	5.12	0.59
395	51.090	0.123	1.51	103	-2.18	101	84	-0.030	5.21	0.56
396	51.214	0.124	1.50	103	-3.06	102	84	-0.030	5.10	0.58
397	51.336	0.122	1.51	103	-0.35	102	84	-0.030	5.05	0.59
398	51.458	0.122	1.51	103	-1.2	94	84	-0.030	5.12	0.59
399	51.581	0.123	1.51	103	-0.37	96	84	-0.030	5.06	0.59
400	51.705	0.124	1.51	103	-0.32	95	84	-0.030	5.04	0.60
401	51.826	0.121	1.50	103	-0.38	92	84	-0.030	4.97	0.59
402	51.947	0.121	1.50	103	-1.25	95	84	-0.030	4.99	0.57
403	52.071	0.124	1.51	103	-0.34	100	84	-0.030	5.04	0.57
404	52.194	0.123	1.51	103	-1.05	97	84	-0.030	5.09	0.58
405	52.316	0.122	1.51	103	-3.56	97	84	-0.040	4.98	0.57
406	52.437	0.121	1.49	103	-0.58	98	84	-0.030	5.00	0.56
407	52.560	0.123	1.51	103	-2.74	96	85	-0.020	5.07	0.56
408	52.683	0.123	1.50	103	-3.54	100	85	-0.040	5.05	0.59
409	52.804	0.121	1.50	103	-3.5	98	85	-0.040	4.98	0.59
410	52.925	0.121	1.49	103	-0.83	97	85	-0.030	5.02	0.58
411	53.048	0.123	1.49	103	-2.19	96	85	-0.040	4.93	0.57
412	53.171	0.123	1.49	103	-1.48	99	85	-0.040	4.93	0.55
413	53.292	0.121	1.49	103	-1.47	89	85	-0.030	4.85	0.57
414	53.413	0.121	1.50	103	-0.48	93	85	-0.030	4.97	0.57
415	53.536	0.123	1.48	103	-0.36	93	85	-0.030	4.99	0.57

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
416	53.658	0.122	1.48	103	-3.08	98	85	-0.040	4.94	0.57
417	53.779	0.121	1.48	103	-3.26	95	85	-0.040	5.00	0.57
418	53.900	0.121	1.49	103	-2.31	95	85	-0.040	4.95	0.52
419	54.022	0.122	1.48	103	-0.29	95	85	-0.030	4.96	0.53
420	54.145	0.123	1.49	103	-3.6	92	85	-0.020	4.95	0.55
421	54.266	0.121	1.50	103	-3.55	98	85	-0.040	4.94	0.57
422	54.385	0.119	1.48	103	-2.76	96	85	-0.050	5.03	0.55
423	54.507	0.122	1.49	103	-0.25	97	85	-0.030	5.03	0.56
424	54.630	0.123	1.48	103	-0.28	101	85	-0.030	4.97	0.57
425	54.751	0.121	1.48	103	-0.34	91	85	-0.030	4.94	0.56
426	54.871	0.120	1.48	103	-0.4	90	85	-0.030	4.94	0.58
427	54.993	0.122	1.48	103	-3.53	97	85	-0.020	4.93	0.57
428	55.116	0.123	1.48	103	-0.75	101	85	-0.020	4.85	0.55
429	55.237	0.121	1.48	103	-0.55	98	85	-0.030	4.88	0.56
430	55.357	0.120	1.48	103	-0.4	97	85	-0.030	4.86	0.54
431	55.478	0.121	1.50	103	-2.4	99	85	-0.030	4.87	0.55
432	55.601	0.123	1.47	103	-2.71	97	85	-0.030	4.94	0.51
433	55.723	0.122	1.47	103	-0.54	96	85	-0.030	4.82	0.53
434	55.843	0.120	1.48	103	-3.68	94	85	-0.030	4.85	0.52
435	55.964	0.121	1.48	103	-2.57	94	85	-0.040	4.80	0.54
436	56.087	0.123	1.49	103	-3.15	102	85	-0.040	4.87	0.54
437	56.209	0.122	1.47	103	-0.79	97	85	-0.030	4.76	0.52
438	56.329	0.120	1.47	103	-0.9	91	85	-0.040	4.85	0.50
439	56.449	0.120	1.48	103	-0.35	98	85	-0.030	4.81	0.52
440	56.572	0.123	1.46	103	-0.45	98	85	-0.040	4.82	0.52
441	56.693	0.121	1.49	103	-0.36	96	85	-0.040	4.80	0.50
442	56.813	0.120	1.47	103	-2.99	99	85	-0.030	4.69	0.49
443	56.933	0.120	1.47	103	-1.9	95	85	-0.040	4.58	0.49
444	57.056	0.123	1.49	103	-3.58	96	85	-0.030	4.79	0.50
445	57.178	0.122	1.49	103	-1.5	97	85	-0.040	4.70	0.50
446	57.298	0.120	1.47	103	-0.89	96	85	-0.030	4.74	0.49
447	57.418	0.120	1.47	103	-3.68	92	85	-0.040	4.69	0.51

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
448	57.539	0.121	1.48	103	-0.61	93	85	-0.020	4.76	0.49
449	57.661	0.122	1.48	103	-2.73	93	85	-0.020	4.80	0.47
450	57.781	0.120	1.47	103	-0.98	100	85	-0.030	4.78	0.49
451	57.901	0.120	1.47	103	-0.57	95	85	-0.030	4.85	0.52
452	58.022	0.121	1.47	103	-0.44	93	85	-0.040	4.87	0.51
453	58.145	0.123	1.46	103	-0.43	94	85	-0.040	4.81	0.51
454	58.266	0.121	1.47	103	-2.76	95	85	-0.030	4.89	0.53
455	58.385	0.119	1.45	103	-1.44	92	85	-0.030	4.78	0.52
456	58.506	0.121	1.46	102	-0.84	94	85	-0.030	4.72	0.50
457	58.629	0.123	1.47	102	-0.45	95	85	-0.040	4.43	0.53
458	58.750	0.121	1.46	102	-0.6	91	85	-0.030	4.38	0.54
459	58.870	0.120	1.46	102	-3.56	98	85	-0.030	4.40	0.52
460	58.989	0.119	1.46	102	-0.93	93	85	-0.020	4.42	0.50
461	59.111	0.122	1.46	102	-0.89	100	85	-0.030	4.39	0.51
462	59.232	0.121	1.46	102	-0.35	90	85	-0.030	4.40	0.49
463	59.352	0.120	1.47	102	-0.56	93	85	-0.030	4.36	0.52
464	59.471	0.119	1.44	102	-2.29	94	85	-0.030	4.27	0.51
465	59.593	0.122	1.48	102	-3.65	96	85	-0.030	4.27	0.51
466	59.714	0.121	1.47	102	-0.4	101	85	-0.020	4.36	0.50
467	59.834	0.120	1.46	102	-3.23	96	85	-0.030	4.21	0.50
468	59.953	0.119	1.45	102	-3.36	98	85	-0.020	4.26	0.49
469	60.074	0.121	1.45	102	-2.74	100	85	-0.040	4.24	0.50
470	60.196	0.122	1.46	102	-1.29	96	85	-0.020	4.25	0.51
471	60.317	0.121	1.47	102	-1.43	94	85	-0.040	4.24	0.49
472	60.436	0.119	1.46	102	-0.59	92	85	-0.030	4.19	0.50
473	60.556	0.120	1.47	102	-3.6	94	85	-0.030	4.22	0.48
474	60.679	0.123	1.47	102	-0.74	99	85	-0.030	4.24	0.49
475	60.799	0.120	1.47	102	-0.28	91	85	-0.040	4.20	0.49
476	60.919	0.120	1.46	102	-3.59	99	85	-0.030	4.19	0.51
477	61.038	0.119	1.46	102	-2.89	96	85	-0.030	4.15	0.49
478	61.159	0.121	1.46	102	-3.63	91	85	-0.020	4.20	0.49
479	61.281	0.122	1.45	102	-3.61	97	85	-0.030	4.22	0.48

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
480	61.400	0.119	1.46	102	-3.35	98	85	-0.030	4.20	0.47
481	61.519	0.119	1.46	102	-0.37	99	85	-0.030	4.28	0.46
482	61.640	0.121	1.48	102	-2.58	88	85	-0.040	4.17	0.49
483	61.762	0.122	1.46	102	-0.75	100	85	-0.020	4.31	0.48
484	61.883	0.121	1.47	102	-2.78	95	85	-0.030	4.16	0.47
485	62.001	0.118	1.46	102	-3.17	88	85	-0.020	4.15	0.47
486	62.122	0.121	1.46	102	-2.72	101	85	-0.020	4.11	0.47
487	62.244	0.122	1.46	102	-3.46	96	85	-0.030	4.19	0.48
488	62.366	0.122	1.47	102	-3.54	91	85	-0.030	4.07	0.47
489	62.484	0.118	1.45	102	-3.54	95	85	-0.030	4.13	0.49
490	62.604	0.120	1.46	102	-2.33	97	85	-0.020	4.09	0.51
491	62.725	0.121	1.46	102	-0.75	95	85	-0.030	4.04	0.48
492	62.847	0.122	1.47	102	-0.69	98	85	-0.030	4.18	0.49
493	62.966	0.119	1.46	102	-3.53	96	85	-0.010	4.15	0.49
494	63.085	0.119	1.46	102	-0.33	92	85	-0.020	4.12	0.47
495	63.206	0.121	1.47	102	-1.24	91	85	-0.030	4.12	0.49
496	63.328	0.122	1.46	102	-1.39	100	85	-0.030	4.07	0.49
497	63.448	0.120	1.46	102	-2.64	94	85	-0.030	4.08	0.47
498	63.567	0.119	1.47	102	-0.37	94	85	-0.040	4.02	0.48
499	63.687	0.120	1.46	102	-1.8	97	85	-0.030	3.95	0.47
500	63.810	0.123	1.47	102	-2.63	97	85	-0.030	4.00	0.48
501	63.931	0.121	1.45	102	-1.07	94	85	-0.030	3.90	0.49
502	64.050	0.119	1.47	102	-0.83	97	84	-0.040	4.12	0.47
503	64.169	0.119	1.45	102	-3.67	97	84	-0.030	3.97	0.48
504	64.291	0.122	1.48	102	-1.41	96	84	-0.030	3.96	0.47
505	64.413	0.122	1.46	102	-3.55	95	85	-0.030	4.01	0.46
506	64.532	0.119	1.47	102	-2.14	88	85	-0.030	4.00	0.47
507	64.651	0.119	1.47	102	-3.66	91	85	-0.040	4.02	0.48
508	64.771	0.120	1.46	102	-1.39	94	85	-0.030	4.08	0.46
509	64.893	0.122	1.45	102	-0.62	92	85	-0.030	4.09	0.46
510	65.013	0.120	1.48	102	-2.64	93	85	-0.030	4.00	0.47
511	65.132	0.119	1.46	102	-3.54	87	85	-0.030	3.96	0.47

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
512	65.253	0.121	1.46	102	-0.96	93	85	-0.030	4.00	0.48
513	65.375	0.122	1.46	102	-0.94	94	85	-0.030	3.97	0.48
514	65.496	0.121	1.47	102	-3.55	96	85	-0.030	3.98	0.46
515	65.615	0.119	1.46	102	-3.56	94	85	-0.040	3.99	0.48
516	65.735	0.120	1.47	102	-3.61	92	84	-0.030	3.85	0.45
517	65.857	0.122	1.46	102	-2.77	101	85	-0.040	3.87	0.49
518	65.978	0.121	1.47	102	-2.03	95	85	-0.030	3.80	0.48
519	66.097	0.119	1.46	102	-0.4	91	85	-0.020	3.91	0.47
520	66.216	0.119	1.46	102	-0.67	90	85	-0.030	3.99	0.47
521	66.337	0.121	1.46	102	-0.78	92	85	-0.040	3.94	0.47
522	66.459	0.122	1.46	102	-0.59	99	84	-0.040	3.90	0.49
523	66.578	0.119	1.45	102	-0.44	96	85	-0.020	3.85	0.46
524	66.698	0.120	1.46	102	-0.44	96	85	-0.030	3.77	0.45
525	66.818	0.120	1.46	102	-0.45	93	85	-0.030	3.85	0.46
526	66.940	0.122	1.44	102	-0.4	94	84	-0.030	3.87	0.49
527	67.061	0.121	1.45	102	-3.01	93	85	-0.020	3.95	0.47
528	67.180	0.119	1.47	102	-2.88	88	84	-0.030	3.87	0.48
529	67.300	0.120	1.46	102	-0.93	98	85	-0.030	3.85	0.48
530	67.423	0.123	1.46	102	-0.4	105	85	-0.040	3.90	0.47
531	67.543	0.120	1.46	102	-0.66	99	85	-0.030	3.85	0.45
532	67.663	0.120	1.46	102	-3.54	96	85	-0.020	4.01	0.47
533	67.782	0.119	1.46	102	-2.51	94	85	-0.030	3.86	0.46
534	67.903	0.121	1.46	102	-0.39	94	85	-0.030	3.85	0.48
535	68.025	0.122	1.46	102	-2.85	92	85	-0.030	3.93	0.48
536	68.144	0.119	1.46	102	-2.47	94	84	-0.030	4.09	0.51
537	68.263	0.119	1.46	102	-2.12	99	85	-0.030	4.09	0.53
538	68.383	0.120	1.46	102	-3.22	91	85	-0.030	3.96	0.51
539	68.506	0.123	1.46	102	-0.51	100	85	-0.010	4.06	0.54
540	68.625	0.119	1.45	102	-0.39	94	85	-0.040	4.05	0.57
541	68.744	0.119	1.46	102	-0.41	97	85	-0.030	4.04	0.54
542	68.865	0.121	1.45	102	-1.66	93	85	-0.040	4.14	0.53
543	68.987	0.122	1.46	102	-3.25	93	85	-0.030	4.04	0.56

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
544	69.107	0.120	1.46	102	-3.69	89	85	-0.030	4.05	0.54
545	69.226	0.119	1.44	102	-3.03	99	85	-0.020	4.12	0.54
546	69.344	0.118	1.44	102	-2	94	85	-0.030	4.06	0.56
547	69.465	0.121	1.45	102	-2.46	91	85	-0.040	4.09	0.56
548	69.585	0.120	1.43	102	-1.11	96	85	-0.030	4.09	0.57
549	69.705	0.120	1.42	102	-1.96	99	85	-0.030	4.07	0.56
550	69.823	0.118	1.44	102	-0.95	96	85	-0.030	4.16	0.53
551	69.942	0.119	1.44	102	-1.38	90	85	-0.040	4.11	0.56
552	70.064	0.122	1.43	102	-2.02	96	85	-0.040	4.10	0.53
553	70.184	0.120	1.42	102	-3.66	97	85	-0.020	4.19	0.53
554	70.301	0.117	1.44	102	-0.45	91	85	-0.040	4.17	0.51
555	70.419	0.118	1.42	102	-1.59	98	85	-0.020	3.98	0.51
556	70.538	0.119	1.42	102	-0.45	93	85	-0.020	4.34	0.53
557	70.659	0.121	1.42	102	-1.41	99	85	-0.030	4.05	0.52
558	70.778	0.119	1.44	102	-0.39	91	85	-0.020	4.08	0.52
559	70.895	0.117	1.43	102	-3.69	94	85	-0.040	4.10	0.58
560	71.014	0.119	1.42	102	-3.52	101	85	-0.030	4.03	0.53
561	71.134	0.120	1.42	102	-2.95	97	85	-0.020	4.01	0.53
562	71.254	0.120	1.42	102	-3.49	94	85	-0.020	3.94	0.53
563	71.372	0.118	1.43	102	-2.09	97	85	-0.040	4.05	0.55
564	71.488	0.116	1.42	102	-3.64	98	85	-0.030	4.00	0.54
565	71.608	0.120	1.43	102	-1.14	94	85	-0.030	4.03	0.55
566	71.728	0.120	1.42	102	-0.86	91	85	-0.030	4.07	0.57
567	71.848	0.120	1.42	102	-2.47	90	85	-0.030	3.96	0.55
568	71.965	0.117	1.42	102	-3.05	90	85	-0.030	3.88	0.56
569	72.083	0.118	1.41	102	-0.47	94	85	-0.030	4.01	0.55
570	72.202	0.119	1.42	102	-0.45	94	85	-0.040	3.95	0.56
571	72.321	0.119	1.41	102	-0.52	94	85	-0.030	3.93	0.56
572	72.440	0.119	1.42	102	-2.33	91	85	-0.020	3.88	0.60
573	72.557	0.117	1.42	102	-2.79	91	85	-0.020	4.03	0.59
574	72.676	0.119	1.41	102	-1.69	95	85	-0.030	3.90	0.55
575	72.796	0.120	1.42	102	-3.52	94	85	-0.030	3.95	0.55

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
576	72.915	0.119	1.42	102	-3.39	97	85	-0.030	3.85	0.52
577	73.032	0.117	1.43	102	-2.08	96	85	-0.030	3.91	0.54
578	73.149	0.117	1.40	102	-0.5	91	85	-0.030	3.91	0.53
579	73.268	0.119	1.40	102	-0.5	90	85	-0.030	3.88	0.54
580	73.388	0.120	1.42	102	-3.19	99	85	-0.040	3.87	0.51
581	73.507	0.119	1.40	102	-2.73	97	85	-0.030	3.86	0.49
582	73.624	0.117	1.41	102	-0.51	95	85	-0.030	3.90	0.51
583	73.741	0.117	1.40	102	-1.97	90	85	-0.020	3.93	0.49
584	73.859	0.118	1.40	102	-3.57	98	85	-0.020	3.79	0.50
585	73.979	0.120	1.40	102	-2.48	97	85	-0.030	3.83	0.51
586	74.097	0.118	1.42	102	-0.95	95	85	-0.040	3.83	0.53
587	74.215	0.118	1.39	102	-1.92	90	85	-0.040	3.85	0.54
588	74.332	0.117	1.40	102	-0.66	98	85	-0.030	3.80	0.50
589	74.450	0.118	1.41	102	-1.1	96	85	-0.040	3.90	0.52
590	74.569	0.119	1.40	102	-3.76	90	85	-0.030	3.87	0.47
591	74.687	0.118	1.41	102	-3.72	99	85	-0.030	3.86	0.50
592	74.804	0.117	1.41	102	-0.98	89	85	-0.030	3.88	0.48
593	74.921	0.117	1.40	102	-2.9	96	85	-0.030	3.84	0.49
594	75.040	0.119	1.40	102	-3.17	94	85	-0.020	3.95	0.49
595	75.159	0.119	1.40	102	-3.69	94	85	-0.030	3.90	0.53
596	75.276	0.117	1.39	102	-0.48	89	85	-0.030	3.85	0.50
597	75.392	0.116	1.40	102	-0.48	87	85	-0.030	3.81	0.51
598	75.511	0.119	1.40	102	-0.9	94	85	-0.030	3.95	0.51
599	75.629	0.118	1.39	102	-0.47	96	85	-0.030	3.81	0.53
600	75.748	0.119	1.40	102	-3.74	91	85	-0.030	3.89	0.49
601	75.864	0.116	1.39	102	-3.37	95	85	-0.040	3.80	0.53
602	75.981	0.117	1.40	102	-2.8	93	85	-0.030	3.87	0.51
603	76.099	0.118	1.39	102	-0.54	91	85	-0.020	3.89	0.50
604	76.217	0.118	1.39	102	-3.31	89	85	-0.030	3.87	0.50
605	76.336	0.119	1.38	102	-0.47	90	85	-0.030	3.77	0.51
606	76.452	0.116	1.38	102	-1.45	89	85	-0.040	3.90	0.51
607	76.569	0.117	1.39	102	-3.71	89	85	-0.020	3.97	0.52

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
608	76.686	0.117	1.40	102	-3.75	87	85	-0.030	3.87	0.49
609	76.806	0.120	1.36	102	-0.61	91	84	-0.030	3.82	0.47
610	76.924	0.118	1.40	102	-1.28	91	85	-0.030	3.77	0.49
611	77.040	0.116	1.39	102	-1.14	88	85	-0.030	3.80	0.50
612	77.156	0.116	1.38	102	-0.61	96	85	-0.030	3.72	0.49
613	77.273	0.117	1.40	102	-3.73	94	85	-0.030	3.83	0.49
614	77.394	0.121	1.40	102	-1.12	92	85	-0.020	3.84	0.51
615	77.511	0.117	1.40	102	-3.4	88	85	-0.040	3.77	0.49
616	77.628	0.117	1.39	102	-0.48	91	84	-0.030	3.76	0.48
617	77.743	0.115	1.38	102	-0.51	94	85	-0.030	3.69	0.48
618	77.861	0.118	1.38	102	-3.84	92	85	-0.030	3.77	0.50
619	77.981	0.120	1.39	102	-3.33	94	85	-0.040	3.79	0.47
620	78.099	0.118	1.39	102	-3.55	93	85	-0.030	3.81	0.50
621	78.215	0.116	1.39	102	-3.73	89	85	-0.030	3.73	0.47
622	78.331	0.116	1.39	102	-2.48	93	85	-0.040	3.80	0.49
623	78.449	0.118	1.39	102	-1.2	91	85	-0.040	3.73	0.50
624	78.568	0.119	1.38	102	-0.93	97	85	-0.030	3.77	0.50
625	78.686	0.118	1.38	102	-1.14	88	85	-0.030	3.68	0.49
626	78.802	0.116	1.38	102	-0.54	90	85	-0.020	3.65	0.48
627	78.918	0.116	1.38	102	-0.78	91	84	-0.030	3.58	0.50
628	79.036	0.118	1.42	102	-1.57	88	85	-0.030	3.69	0.48
629	79.155	0.119	1.40	102	-0.57	90	85	-0.030	3.64	0.46
630	79.273	0.118	1.39	102	-3.75	91	84	-0.030	3.64	0.46
631	79.389	0.116	1.38	102	-3.04	93	84	-0.030	3.63	0.45
632	79.505	0.116	1.39	102	-0.67	92	84	-0.030	3.65	0.45
633	79.623	0.118	1.39	102	-0.48	96	84	-0.030	3.72	0.47
634	79.742	0.119	1.39	102	-1.29	94	84	-0.030	3.63	0.49
635	79.860	0.118	1.38	102	-2.71	98	84	-0.040	3.54	0.48
Avg/Tot	79.860	0.126	1.59	104	-1.75	100	83	-0.041	5.91	0.56

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	415	514	504	294	200	385.4	N/A
1	413	509	581	286	202	398.2	N/A
2	410	506	482	281	203	376.4	N/A
3	406	502	463	277	204	370.4	N/A
4	402	496	503	273	204	375.6	N/A
5	431	498	490	276	204	379.8	N/A
6	439	498	570	292	202	400.2	N/A
7	444	498	515	321	200	395.6	N/A
8	447	496	477	351	197	393.6	N/A
9	450	495	448	376	196	393.0	N/A
10	419	485	450	386	196	387.2	N/A
11	411	479	436	392	198	383.2	N/A
12	405	471	418	401	200	379.0	N/A
13	400	467	415	410	201	378.6	N/A
14	397	463	421	417	203	380.2	N/A
15	394	460	421	425	204	380.8	N/A
16	391	458	420	428	205	380.4	N/A
17	388	456	419	428	206	379.4	N/A
18	409	457	438	430	207	388.2	N/A
19	420	459	419	439	204	388.2	N/A
20	426	461	410	445	200	388.4	N/A
21	401	459	407	439	200	381.2	N/A
22	395	455	406	430	202	377.6	N/A
23	390	452	406	425	203	375.2	N/A
24	385	448	405	420	204	372.4	N/A
25	380	445	404	419	204	370.4	N/A
26	377	442	404	418	204	369.0	N/A
27	373	440	405	416	204	367.6	N/A
28	370	437	404	414	204	365.8	N/A
29	367	434	402	411	204	363.6	N/A
30	364	432	400	411	204	362.2	N/A
31	362	430	399	409	203	360.6	N/A
32	359	428	399	408	203	359.4	N/A
33	357	426	397	406	202	357.6	N/A
34	355	424	395	403	201	355.6	N/A
35	354	422	392	402	201	354.2	N/A
36	352	420	390	400	200	352.4	N/A
37	350	418	389	398	200	351.0	N/A
38	349	418	388	398	199	350.4	N/A
39	348	415	385	397	198	348.6	N/A
40	346	413	384	395	198	347.2	N/A
41	346	412	382	394	197	346.2	N/A
42	344	411	380	394	197	345.2	N/A
43	343	409	378	392	196	343.6	N/A
44	342	409	376	392	195	342.8	N/A
45	341	407	374	390	194	341.2	N/A
46	340	406	373	390	194	340.6	N/A
47	340	405	374	390	193	340.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
48	339	405	373	390	192	339.8	N/A
49	338	403	372	390	192	339.0	N/A
50	338	403	371	390	191	338.6	N/A
51	336	401	369	386	190	336.4	N/A
52	336	400	368	386	190	336.0	N/A
53	335	399	367	384	189	334.8	N/A
54	334	398	365	383	189	333.8	N/A
55	333	397	364	381	188	332.6	N/A
56	332	396	363	381	187	331.8	N/A
57	331	395	362	378	187	330.6	N/A
58	330	393	361	378	186	329.6	N/A
59	330	393	360	378	185	329.2	N/A
60	328	392	359	377	185	328.2	N/A
61	328	392	358	377	184	327.8	N/A
62	327	392	357	377	184	327.4	N/A
63	326	389	356	378	183	326.4	N/A
64	325	390	355	377	182	325.8	N/A
65	325	389	354	379	181	325.6	N/A
66	325	389	353	380	181	325.6	N/A
67	324	389	352	381	180	325.2	N/A
68	324	388	352	382	180	325.2	N/A
69	324	388	351	383	179	325.0	N/A
70	324	389	350	384	179	325.2	N/A
71	324	389	350	385	178	325.2	N/A
72	324	389	350	387	177	325.4	N/A
73	324	390	350	389	177	326.0	N/A
74	325	390	349	392	176	326.4	N/A
75	325	390	349	394	175	326.6	N/A
76	326	392	348	397	175	327.6	N/A
77	326	392	348	399	174	327.8	N/A
78	326	393	348	401	174	328.4	N/A
79	327	394	347	403	173	328.8	N/A
80	328	395	347	405	173	329.6	N/A
81	329	397	347	405	172	330.0	N/A
82	330	397	347	409	172	331.0	N/A
83	331	400	347	410	171	331.8	N/A
84	331	400	347	413	171	332.4	N/A
85	333	402	347	414	170	333.2	N/A
86	334	403	347	417	170	334.2	N/A
87	335	404	347	417	169	334.4	N/A
88	337	406	347	419	169	335.6	N/A
89	338	407	347	421	169	336.4	N/A
90	339	409	347	422	168	337.0	N/A
91	340	409	347	421	168	337.0	N/A
92	341	411	347	421	167	337.4	N/A
93	342	413	348	421	167	338.2	N/A
94	343	413	348	420	167	338.2	N/A
95	344	415	348	419	166	338.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
96	346	416	348	419	166	339.0	N/A	
97	347	418	349	419	165	339.6	N/A	
98	347	418	349	419	165	339.6	N/A	
99	349	420	350	418	165	340.4	N/A	
100	350	421	350	418	164	340.6	N/A	
101	350	422	350	418	164	340.8	N/A	
102	352	422	350	416	164	340.8	N/A	
103	353	424	350	418	163	341.6	N/A	
104	353	425	351	408	163	340.0	N/A	
105	355	426	351	418	163	342.6	N/A	
106	356	428	352	418	162	343.2	N/A	
107	356	428	352	417	162	343.0	N/A	
108	357	429	353	417	162	343.6	N/A	
109	358	429	353	415	161	343.2	N/A	
110	359	430	354	416	161	344.0	N/A	
111	359	432	354	415	161	344.2	N/A	
112	360	432	354	414	161	344.2	N/A	
113	361	433	354	414	160	344.4	N/A	
114	361	433	355	413	160	344.4	N/A	
115	362	434	355	413	160	344.8	N/A	
116	363	434	355	413	159	344.8	N/A	
117	363	434	355	412	159	344.6	N/A	
118	364	436	355	411	159	345.0	N/A	
119	365	436	355	411	159	345.2	N/A	
120	366	436	356	410	158	345.2	N/A	
121	365	437	356	410	158	345.2	N/A	
122	366	437	356	408	158	345.0	N/A	
123	367	437	356	407	158	345.0	N/A	
124	367	437	357	406	158	345.0	N/A	
125	368	437	357	405	158	345.0	N/A	
126	368	438	357	403	157	344.6	N/A	
127	368	438	357	404	157	344.8	N/A	
128	368	438	358	403	157	344.8	N/A	
129	369	438	358	404	157	345.2	N/A	
130	369	438	359	404	157	345.4	N/A	
131	369	439	359	404	157	345.6	N/A	
132	370	439	359	405	157	346.0	N/A	
133	370	440	360	377	156	340.6	N/A	
134	370	441	361	366	156	338.8	N/A	
135	370	440	362	394	156	344.4	N/A	
136	370	441	362	364	156	338.6	N/A	
137	371	441	363	376	156	341.4	N/A	
138	370	441	363	399	156	345.8	N/A	
139	370	441	363	396	156	345.2	N/A	
140	370	442	363	393	155	344.6	N/A	
141	369	441	363	390	155	343.6	N/A	
142	369	441	363	388	155	343.2	N/A	
143	369	440	363	387	155	342.8	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
144	368	440	363	386	155	342.4	N/A
145	367	440	363	384	155	341.8	N/A
146	366	438	362	382	155	340.6	N/A
147	365	438	362	379	155	339.8	N/A
148	364	438	361	376	155	338.8	N/A
149	362	437	360	373	155	337.4	N/A
150	361	436	359	370	154	336.0	N/A
151	359	434	359	367	154	334.6	N/A
152	358	435	358	365	154	334.0	N/A
153	356	433	357	362	154	332.4	N/A
154	353	431	356	360	154	330.8	N/A
155	352	431	354	358	154	329.8	N/A
156	349	430	353	356	154	328.4	N/A
157	348	427	353	354	154	327.2	N/A
158	346	427	352	354	154	326.6	N/A
159	345	426	352	353	154	326.0	N/A
160	344	424	351	350	154	324.6	N/A
161	342	423	349	351	154	323.8	N/A
162	340	421	348	349	154	322.4	N/A
163	339	420	347	347	154	321.4	N/A
164	337	418	345	342	154	319.2	N/A
165	335	415	342	337	154	316.6	N/A
166	334	412	339	331	154	314.0	N/A
167	332	410	335	325	153	311.0	N/A
168	330	408	333	319	153	308.6	N/A
169	329	407	331	314	154	307.0	N/A
170	327	404	330	307	154	304.4	N/A
171	326	402	329	301	153	302.2	N/A
172	324	400	328	295	153	300.0	N/A
173	322	398	327	290	153	298.0	N/A
174	321	395	325	285	153	295.8	N/A
175	319	392	322	280	153	293.2	N/A
176	317	390	321	276	153	291.4	N/A
177	316	388	318	273	153	289.6	N/A
178	315	386	316	269	153	287.8	N/A
179	313	383	314	266	153	285.8	N/A
180	312	382	313	263	153	284.6	N/A
181	311	379	311	260	153	282.8	N/A
182	309	377	310	257	153	281.2	N/A
183	308	375	308	255	153	279.8	N/A
184	307	373	307	253	153	278.6	N/A
185	306	372	306	251	153	277.6	N/A
186	305	370	304	249	153	276.2	N/A
187	303	368	303	247	153	274.8	N/A
188	303	367	302	245	153	274.0	N/A
189	301	365	301	244	153	272.8	N/A
190	300	364	299	242	153	271.6	N/A
191	299	362	298	241	153	270.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (*F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
192	298	360	297	239	153	269.4	N/A
193	297	359	296	238	153	268.6	N/A
194	296	359	295	237	153	268.0	N/A
195	295	356	294	236	153	266.8	N/A
196	295	356	293	235	153	266.4	N/A
197	294	354	292	234	153	265.4	N/A
198	293	353	291	233	153	264.6	N/A
199	292	352	290	232	154	264.0	N/A
200	291	350	289	231	154	263.0	N/A
201	290	350	288	230	154	262.4	N/A
202	290	348	288	230	154	262.0	N/A
203	289	348	287	229	154	261.4	N/A
204	289	347	286	228	154	260.8	N/A
205	288	346	285	227	154	260.0	N/A
206	287	345	284	227	154	259.4	N/A
207	286	344	284	226	154	258.8	N/A
208	285	343	283	226	154	258.2	N/A
209	285	342	282	225	154	257.6	N/A
210	284	341	282	225	154	257.2	N/A
211	284	341	281	224	154	256.8	N/A
212	283	340	281	224	154	256.4	N/A
213	282	339	280	223	154	255.6	N/A
214	282	339	280	222	154	255.4	N/A
215	281	337	279	222	154	254.6	N/A
216	281	337	278	222	154	254.4	N/A
217	280	336	278	222	154	254.0	N/A
218	279	336	277	221	154	253.4	N/A
219	279	335	277	221	154	253.2	N/A
220	278	334	276	221	155	252.8	N/A
221	278	334	276	220	155	252.6	N/A
222	277	333	275	220	155	252.0	N/A
223	277	332	275	220	155	251.8	N/A
224	277	332	274	220	155	251.6	N/A
225	276	332	274	219	155	251.2	N/A
226	276	331	274	219	155	251.0	N/A
227	275	330	273	219	155	250.4	N/A
228	275	330	273	218	155	250.2	N/A
229	274	329	273	218	155	249.8	N/A
230	274	328	273	218	155	249.6	N/A
231	274	328	272	218	155	249.4	N/A
232	273	327	272	218	156	249.2	N/A
233	273	328	272	217	156	249.2	N/A
234	273	327	272	217	156	249.0	N/A
235	272	326	272	217	156	248.6	N/A
236	272	326	272	217	156	248.6	N/A
237	271	325	271	217	156	248.0	N/A
238	271	325	271	217	156	248.0	N/A
239	271	324	271	217	156	247.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	271	324	271	217	156	247.8	N/A
241	270	324	271	216	157	247.6	N/A
242	270	323	271	216	157	247.4	N/A
243	270	323	271	216	157	247.4	N/A
244	269	322	271	216	157	247.0	N/A
245	269	321	271	216	157	246.8	N/A
246	269	321	271	216	157	246.8	N/A
247	269	321	271	216	157	246.8	N/A
248	268	321	271	216	157	246.6	N/A
249	268	320	271	216	157	246.4	N/A
250	268	319	271	216	158	246.4	N/A
251	268	319	271	216	158	246.4	N/A
252	268	319	271	216	158	246.4	N/A
253	268	320	271	217	158	246.8	N/A
254	267	319	271	216	158	246.2	N/A
255	267	318	271	217	158	246.2	N/A
256	267	318	271	218	158	246.4	N/A
257	266	317	271	218	158	246.0	N/A
258	267	317	271	219	159	246.6	N/A
259	266	317	271	219	159	246.4	N/A
260	266	317	271	219	159	246.4	N/A
261	266	317	271	220	159	246.6	N/A
262	266	317	272	220	159	246.8	N/A
263	265	317	272	220	159	246.6	N/A
264	265	316	271	220	159	246.2	N/A
265	265	316	272	220	159	246.4	N/A
266	265	316	272	220	159	246.4	N/A
267	265	316	272	220	159	246.4	N/A
268	264	316	272	220	159	246.2	N/A
269	264	316	272	220	160	246.4	N/A
270	264	315	272	221	160	246.4	N/A
271	264	316	272	220	160	246.4	N/A
272	264	315	272	220	160	246.2	N/A
273	263	316	272	220	160	246.2	N/A
274	263	316	272	221	160	246.4	N/A
275	263	316	272	220	160	246.2	N/A
276	263	316	272	220	160	246.2	N/A
277	262	316	272	220	160	246.0	N/A
278	263	316	273	220	160	246.4	N/A
279	263	316	273	220	160	246.4	N/A
280	262	316	273	221	160	246.4	N/A
281	262	316	273	220	160	246.2	N/A
282	262	317	273	220	160	246.4	N/A
283	262	317	273	220	160	246.4	N/A
284	262	316	273	220	160	246.2	N/A
285	262	316	273	220	160	246.2	N/A
286	261	317	273	220	160	246.2	N/A
287	261	317	273	220	160	246.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (*F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	261	317	273	221	160	246.4	N/A
289	261	317	273	221	160	246.4	N/A
290	261	317	273	221	160	246.4	N/A
291	261	317	273	221	160	246.4	N/A
292	261	316	273	221	160	246.2	N/A
293	261	317	273	221	160	246.4	N/A
294	261	317	273	221	161	246.6	N/A
295	261	317	273	221	161	246.6	N/A
296	261	317	273	221	161	246.6	N/A
297	260	317	273	221	161	246.4	N/A
298	261	317	273	221	161	246.6	N/A
299	261	316	273	221	161	246.4	N/A
300	261	317	273	221	161	246.6	N/A
301	261	316	273	221	161	246.4	N/A
302	260	317	273	222	161	246.6	N/A
303	260	316	273	222	161	246.4	N/A
304	260	317	274	222	161	246.8	N/A
305	260	317	274	222	161	246.8	N/A
306	261	316	275	222	161	247.0	N/A
307	261	316	275	222	161	247.0	N/A
308	261	316	276	223	161	247.4	N/A
309	261	316	276	222	161	247.2	N/A
310	261	316	277	223	161	247.6	N/A
311	261	316	277	222	161	247.4	N/A
312	261	316	278	223	161	247.8	N/A
313	261	317	278	223	161	248.0	N/A
314	261	316	279	223	161	248.0	N/A
315	261	316	279	223	161	248.0	N/A
316	261	316	279	223	161	248.0	N/A
317	261	316	280	223	161	248.2	N/A
318	261	316	280	223	161	248.2	N/A
319	261	316	280	223	161	248.2	N/A
320	261	316	280	224	161	248.4	N/A
321	261	316	281	224	161	248.6	N/A
322	261	315	281	224	161	248.4	N/A
323	262	316	281	224	161	248.8	N/A
324	262	315	282	224	161	248.8	N/A
325	262	316	282	224	161	249.0	N/A
326	261	315	282	224	161	248.6	N/A
327	262	315	282	224	161	248.8	N/A
328	262	315	283	224	161	249.0	N/A
329	262	316	283	224	161	249.2	N/A
330	262	315	283	224	161	249.0	N/A
331	262	315	282	224	161	248.8	N/A
332	262	315	283	224	161	249.0	N/A
333	262	315	282	224	162	249.0	N/A
334	262	315	282	224	161	248.8	N/A
335	262	315	282	224	161	248.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
336	262	314	282	224	161	248.6	N/A
337	263	314	283	225	162	249.4	N/A
338	263	315	282	225	162	249.4	N/A
339	263	314	283	225	162	249.4	N/A
340	263	314	282	225	161	249.0	N/A
341	263	314	282	225	161	249.0	N/A
342	263	314	282	225	161	249.0	N/A
343	263	314	282	226	161	249.2	N/A
344	263	314	282	226	162	249.4	N/A
345	264	315	282	226	161	249.6	N/A
346	264	314	282	226	161	249.4	N/A
347	264	314	282	226	161	249.4	N/A
348	264	314	282	226	161	249.4	N/A
349	264	314	283	226	161	249.6	N/A
350	264	314	283	226	161	249.6	N/A
351	265	314	283	226	161	249.8	N/A
352	264	315	284	226	161	250.0	N/A
353	265	315	284	227	161	250.4	N/A
354	265	315	284	227	162	250.6	N/A
355	264	315	284	227	161	250.2	N/A
356	265	314	284	227	161	250.2	N/A
357	265	314	284	227	161	250.2	N/A
358	266	315	284	227	161	250.6	N/A
359	265	315	284	228	162	250.8	N/A
360	265	315	284	227	162	250.6	N/A
361	265	315	285	228	162	251.0	N/A
362	265	315	285	228	162	251.0	N/A
363	266	315	285	228	162	251.2	N/A
364	266	315	285	228	161	251.0	N/A
365	266	315	285	228	162	251.2	N/A
366	266	315	286	229	162	251.6	N/A
367	266	316	286	229	162	251.8	N/A
368	266	315	286	229	162	251.6	N/A
369	266	315	286	229	162	251.6	N/A
370	266	315	286	229	162	251.6	N/A
371	266	315	286	229	162	251.6	N/A
372	266	315	286	229	162	251.6	N/A
373	266	315	286	229	162	251.6	N/A
374	267	315	287	229	161	251.8	N/A
375	267	316	287	229	162	252.2	N/A
376	266	315	287	228	162	251.6	N/A
377	266	316	287	228	162	251.8	N/A
378	267	316	287	228	162	252.0	N/A
379	267	316	287	228	162	252.0	N/A
380	266	316	286	228	162	251.6	N/A
381	266	316	286	227	162	251.4	N/A
382	266	316	286	227	162	251.4	N/A
383	266	316	286	227	162	251.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (*F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
384	266	316	286	226	162	251.2	N/A
385	266	316	287	226	162	251.4	N/A
386	266	315	286	226	162	251.0	N/A
387	265	316	286	225	162	250.8	N/A
388	265	315	286	225	162	250.6	N/A
389	265	315	286	225	162	250.6	N/A
390	265	315	286	225	162	250.6	N/A
391	265	315	286	225	162	250.6	N/A
392	264	315	286	225	161	250.2	N/A
393	264	315	286	224	161	250.0	N/A
394	264	314	286	224	161	249.8	N/A
395	264	314	286	224	161	249.8	N/A
396	264	314	286	224	161	249.8	N/A
397	264	313	287	223	161	249.6	N/A
398	264	314	286	223	161	249.6	N/A
399	264	313	286	223	161	249.4	N/A
400	263	313	287	223	161	249.4	N/A
401	263	312	287	223	161	249.2	N/A
402	263	312	287	223	161	249.2	N/A
403	263	313	287	222	161	249.2	N/A
404	263	312	286	223	161	249.0	N/A
405	262	311	286	222	161	248.4	N/A
406	262	311	286	222	161	248.4	N/A
407	262	311	286	222	160	248.2	N/A
408	262	311	286	222	160	248.2	N/A
409	262	311	286	222	160	248.2	N/A
410	262	310	286	222	160	248.0	N/A
411	261	310	286	221	160	247.6	N/A
412	261	309	286	221	160	247.4	N/A
413	261	309	286	221	160	247.4	N/A
414	261	309	286	221	160	247.4	N/A
415	261	309	286	221	160	247.4	N/A
416	261	308	286	221	160	247.2	N/A
417	261	309	286	222	159	247.4	N/A
418	261	308	286	222	159	247.2	N/A
419	261	308	286	222	159	247.2	N/A
420	261	308	286	222	159	247.2	N/A
421	261	307	286	222	159	247.0	N/A
422	261	308	286	221	159	247.0	N/A
423	261	307	285	221	159	246.6	N/A
424	262	307	285	221	159	246.8	N/A
425	262	307	285	221	159	246.8	N/A
426	262	307	285	221	158	246.6	N/A
427	262	306	285	221	158	246.4	N/A
428	262	306	285	221	158	246.4	N/A
429	263	306	285	221	158	246.6	N/A
430	263	305	285	221	158	246.4	N/A
431	263	305	284	221	158	246.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
432	262	305	284	221	158	246.0	N/A
433	263	305	284	221	158	246.2	N/A
434	262	305	284	221	158	246.0	N/A
435	263	304	284	221	157	245.8	N/A
436	263	304	284	220	157	245.6	N/A
437	263	304	284	220	157	245.6	N/A
438	263	303	284	220	157	245.4	N/A
439	263	303	283	220	157	245.2	N/A
440	263	303	283	220	157	245.2	N/A
441	263	303	283	219	157	245.0	N/A
442	263	303	283	219	156	244.8	N/A
443	262	302	283	219	156	244.4	N/A
444	262	302	282	219	156	244.2	N/A
445	262	302	282	219	156	244.2	N/A
446	262	302	282	219	156	244.2	N/A
447	262	301	282	219	156	244.0	N/A
448	262	301	282	218	156	243.8	N/A
449	262	301	282	218	156	243.8	N/A
450	261	301	282	218	156	243.6	N/A
451	261	301	281	218	156	243.4	N/A
452	261	301	281	218	155	243.2	N/A
453	261	300	281	218	155	243.0	N/A
454	260	300	281	218	155	242.8	N/A
455	260	300	281	218	155	242.8	N/A
456	260	300	281	217	155	242.6	N/A
457	260	300	281	217	155	242.6	N/A
458	260	300	280	217	155	242.4	N/A
459	260	300	280	217	154	242.2	N/A
460	260	300	279	216	154	241.8	N/A
461	259	299	280	216	154	241.6	N/A
462	259	299	279	216	154	241.4	N/A
463	259	299	279	216	154	241.4	N/A
464	259	299	280	216	154	241.6	N/A
465	258	298	281	215	154	241.2	N/A
466	258	299	281	215	154	241.4	N/A
467	257	298	281	215	153	240.8	N/A
468	257	298	280	214	153	240.4	N/A
469	256	297	278	214	153	239.6	N/A
470	256	298	277	214	153	239.6	N/A
471	255	297	277	214	153	239.2	N/A
472	255	297	276	213	153	238.8	N/A
473	254	296	276	214	153	238.6	N/A
474	254	296	275	213	152	238.0	N/A
475	253	296	274	213	152	237.6	N/A
476	252	295	274	212	152	237.0	N/A
477	252	295	274	212	152	237.0	N/A
478	251	295	275	212	152	237.0	N/A
479	250	294	274	211	152	236.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	250	294	273	211	151	235.8	N/A
481	250	293	273	211	151	235.6	N/A
482	249	292	270	211	151	234.6	N/A
483	248	292	269	210	151	234.0	N/A
484	248	292	267	210	151	233.6	N/A
485	247	292	267	210	151	233.4	N/A
486	246	291	267	210	150	232.8	N/A
487	246	291	267	210	150	232.8	N/A
488	246	291	267	210	150	232.8	N/A
489	245	290	266	209	150	232.0	N/A
490	245	290	267	209	150	232.2	N/A
491	244	290	268	209	149	232.0	N/A
492	244	290	268	209	149	232.0	N/A
493	243	289	269	209	149	231.8	N/A
494	243	289	270	209	149	232.0	N/A
495	243	288	271	208	149	231.8	N/A
496	242	287	271	208	149	231.4	N/A
497	242	287	268	208	149	230.8	N/A
498	241	287	269	208	148	230.6	N/A
499	241	287	268	207	148	230.2	N/A
500	240	287	270	207	148	230.4	N/A
501	240	286	271	207	148	230.4	N/A
502	239	285	272	206	148	230.0	N/A
503	239	285	277	206	148	231.0	N/A
504	238	285	278	206	147	230.8	N/A
505	238	285	278	206	147	230.8	N/A
506	237	284	277	206	147	230.2	N/A
507	237	284	277	205	147	230.0	N/A
508	238	284	275	205	147	229.8	N/A
509	236	283	273	205	147	228.8	N/A
510	235	283	274	204	146	228.4	N/A
511	235	282	273	204	146	228.0	N/A
512	235	282	276	204	146	228.6	N/A
513	274	281	274	204	146	235.8	N/A
514	240	281	277	204	146	229.6	N/A
515	233	281	278	203	146	228.2	N/A
516	233	280	278	203	146	228.0	N/A
517	255	280	276	203	146	232.0	N/A
518	236	280	277	203	145	228.2	N/A
519	232	279	275	202	145	226.6	N/A
520	293	279	274	202	145	238.6	N/A
521	231	279	273	202	145	226.0	N/A
522	262	278	274	201	145	232.0	N/A
523	211	278	273	201	145	221.6	N/A
524	378	278	273	201	145	255.0	N/A
525	251	278	272	201	145	229.4	N/A
526	314	277	273	200	144	241.6	N/A
527	257	277	272	200	144	230.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
528	214	277	271	200	144	221.2	N/A
529	224	277	270	200	144	223.0	N/A
530	227	277	270	200	144	223.6	N/A
531	241	276	269	200	144	226.0	N/A
532	227	276	269	199	144	223.0	N/A
533	226	275	269	199	144	222.6	N/A
534	219	275	268	199	144	221.0	N/A
535	225	274	268	199	143	221.8	N/A
536	234	275	267	199	143	223.6	N/A
537	211	275	267	199	143	219.0	N/A
538	241	274	266	199	143	224.6	N/A
539	245	274	266	199	143	225.4	N/A
540	225	274	266	199	143	221.4	N/A
541	227	274	265	198	143	221.4	N/A
542	223	274	265	199	143	220.8	N/A
543	224	274	264	199	143	220.8	N/A
544	223	273	264	199	143	220.4	N/A
545	223	273	264	199	142	220.2	N/A
546	223	273	264	199	142	220.2	N/A
547	222	273	263	199	142	219.8	N/A
548	222	273	263	199	142	219.8	N/A
549	222	273	263	199	142	219.8	N/A
550	222	273	263	199	142	219.8	N/A
551	222	273	262	199	142	219.6	N/A
552	222	272	262	199	142	219.4	N/A
553	221	272	262	199	142	219.2	N/A
554	212	272	262	199	142	217.4	N/A
555	222	272	261	199	142	219.2	N/A
556	222	272	261	199	142	219.2	N/A
557	221	273	261	199	142	219.2	N/A
558	222	272	261	199	142	219.2	N/A
559	223	272	260	199	142	219.2	N/A
560	221	272	260	199	142	218.8	N/A
561	221	272	260	199	142	218.8	N/A
562	221	272	260	199	142	218.8	N/A
563	221	271	260	199	142	218.6	N/A
564	221	272	260	199	142	218.8	N/A
565	221	271	260	199	142	218.6	N/A
566	221	271	260	199	142	218.6	N/A
567	221	271	260	199	142	218.6	N/A
568	221	271	259	199	142	218.4	N/A
569	220	270	259	199	142	218.0	N/A
570	220	270	259	199	142	218.0	N/A
571	220	271	259	199	142	218.2	N/A
572	220	270	259	199	142	218.0	N/A
573	220	270	259	198	142	217.8	N/A
574	219	270	258	198	142	217.4	N/A
575	219	270	258	198	142	217.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 2Technician: AKDate: 5/15/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
576	219	270	258	198	142	217.4	N/A	
577	219	270	258	198	142	217.4	N/A	
578	219	270	258	198	142	217.4	N/A	
579	218	270	258	198	142	217.2	N/A	
580	218	270	258	198	142	217.2	N/A	
581	218	270	257	198	142	217.0	N/A	
582	218	270	257	197	142	216.8	N/A	
583	217	269	257	197	142	216.4	N/A	
584	217	270	257	197	142	216.6	N/A	
585	217	269	257	197	142	216.4	N/A	
586	217	270	256	197	142	216.4	N/A	
587	217	269	256	197	142	216.2	N/A	
588	216	269	256	197	142	216.0	N/A	
589	216	269	256	197	142	216.0	N/A	
590	216	269	256	197	142	216.0	N/A	
591	215	269	256	197	142	215.8	N/A	
592	215	269	256	196	142	215.6	N/A	
593	215	269	255	196	142	215.4	N/A	
594	215	268	255	196	142	215.2	N/A	
595	215	269	255	196	142	215.4	N/A	
596	214	268	255	196	142	215.0	N/A	
597	214	268	255	196	142	215.0	N/A	
598	214	268	255	196	142	215.0	N/A	
599	213	268	254	196	142	214.6	N/A	
600	214	267	254	196	142	214.6	N/A	
601	213	267	254	195	142	214.2	N/A	
602	213	268	254	196	142	214.6	N/A	
603	213	267	254	196	142	214.4	N/A	
604	213	267	254	195	142	214.2	N/A	
605	213	267	254	196	142	214.4	N/A	
606	213	267	254	196	142	214.4	N/A	
607	213	267	254	195	142	214.2	N/A	
608	212	267	253	195	142	213.8	N/A	
609	212	267	254	195	142	214.0	N/A	
610	212	266	253	195	142	213.6	N/A	
611	211	266	253	195	142	213.4	N/A	
612	211	266	253	195	142	213.4	N/A	
613	211	266	253	195	142	213.4	N/A	
614	211	266	253	195	142	213.4	N/A	
615	211	265	253	195	142	213.2	N/A	
616	210	265	253	195	142	213.0	N/A	
617	210	265	253	195	142	213.0	N/A	
618	210	265	253	195	142	213.0	N/A	
619	210	264	253	194	142	212.6	N/A	
620	210	265	253	195	142	213.0	N/A	
621	209	264	253	195	142	212.6	N/A	
622	209	264	252	195	142	212.4	N/A	
623	209	264	252	195	142	212.4	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
624	209	263	252	195	142	212.2	N/A
625	209	263	252	194	142	212.0	N/A
626	209	263	252	194	142	212.0	N/A
627	208	263	252	194	142	211.8	N/A
628	208	263	252	194	142	211.8	N/A
629	208	262	251	194	142	211.4	N/A
630	208	262	251	194	142	211.4	N/A
631	208	262	251	194	142	211.4	N/A
632	207	261	251	194	142	211.0	N/A
633	207	261	251	193	142	210.8	N/A
634	207	261	251	193	141	210.6	N/A
635	206	261	251	193	141	210.4	N/A
Average	282	338	302	263	159	269	N/A

LAB SAMPLE DATA - ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 2

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/15/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T468	95.0	95.0	100.4	5.4
Train A Filters - Remainder	T469	94.4	188.7	190.3	1.6
	T470	94.3			
Train A Probe	3A	116073.9	116073.9	116074.9	1.0
Train A O-Rings	3A	3579.8	3579.8	3579.4	0.0*
Train B Filters	T471	93.9	187.8	191.7	3.9
	T472	93.9			
Train B Probe	3B	116338.9	116338.9	116340.4	1.5
Train B O-Rings	3B	3568.2	3568.2	3569.4	1.2
Background Filter			0.0	0.0	

**Negative value corrected to zero*

Placed in Dessicator on:	
---------------------------------	--

Train A Filters - First Hour	100.5	5/18 8:35	100.4	5/19 8:51		
Train A Filters - Remainder	190.3	5/18 8:35	190.3	5/19 8:52		
Train A Probe	116074.9	5/18 8:31	116074.9	5/19 8:46		
Train A O-Rings	3579.6	5/18 8:33	3579.4	5/19 8:48		
Train B Filters	191.7	5/18 8:35	191.7	5/19 8:52		
Train B Probe	116340.4	5/18 8:31	116340.4	5/19 8:46		
Train B O-Rings	3569.2	5/18 8:33	3569.4	5/19 8:48		
Background Filter						

1st hour Sub-Total, mg:	5.4
Remainder Sub-Total, mg:	2.6
Train 1 Aggregate, mg:	8.0
Train 2 Aggregate, mg:	6.6
Ambient Aggregate, mg:	0.0

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515



Run 3 Data Summary

Client: England's Stove Works
Model: 15-W06
Job #: 20-601
Tracking #: 0071
Test Date: 5/18/2020



Technician Signature

6/2/2020

Date

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 20-601 Tracking #: 71
 Model: 15-W06 Run Number: 2 Test Date: 5/15/20

Wood Heater Run Notes

Pre-Test Notes

Pre-Test Start Time: N/A
 Air Control Setting: N/A

Time	Notes
	See run 1

Test Notes

Test Burn Start Time: 14:54
 Air Control Setting: ~~5/8" open~~ Fully Closed

Time	Notes
0:55	Fuel loaded
2:00	Closed door, air set to fully open
14:30	Air adjusted to test setting
60:00	Changed filter A

Test Burn End Time: 5/16 01:16

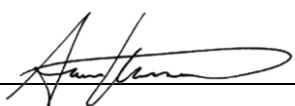
Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO₂ (%): 16.90 CO (%): 4.18
 Mid Gas CO₂ (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	5/15 8:30	5/15 8:35	5/15 8:32	5/16 10:38	5/16 10:44	5/16 10:41
CO ₂	0.00	9.96	16.90	-0.01	9.87	16.86
CO	0.000	2.427	4.180	-0.001	2.418	4.177

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

Technician Signature: 

Date: 4/29/2021
 Page 1 of 3

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works

Job Number: 20-601

Tracking #: 71

Model: 15-W06

Run Number: 2

Test Date: 5/15/20

Test Photos



Low Fire Fuel Load



Low Fire Fuel Loaded

Technician Signature: _____



Date: _____

4/29/2021

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: England's Stove WorksModel: 15-W06Run #: 3Job #: 20-601Tracking #: 0071Technician: AKDate: 5/18/2020

Burn Rate (kg/hr):	1.38
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	0.000	71.590	67.581	7.760
Average Gas Velocity in Dilution Tunnel (ft/sec)	16.52			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	10866.9			
Average Gas Meter Temperature (°F)	73.0	96.9	98.8	84.1
Total Sample Volume (dscf)	0.000	68.968	64.565	7.651
Average Tunnel Temperature (°F)	95.9			
Total Time of Test (min)	544			
Total Particulate Catch (mg)	0.0	9.9	10.1	6.3
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0001435	0.0001564	0.0008234
Total PM Emissions (g)	0.00	14.14	15.41	8.95
Particulate Emission Rate (g/hr)	0.00	1.56	1.70	8.95
Emissions Factor (g/kg)	-	1.12	1.23	-
Difference from Average Total Particulate Emissions (g)	-	0.63	0.63	-
Difference from Average Emissions Factor (g/kg)	-	0.05	0.05	-

Final Average Results	
Total Particulate Emissions (g)	14.78
Particulate Emission Rate (g/hr)	1.63
Emissions Factor (g/kg)	1.17
HHV Efficiency (%)	72.0%
LHV Efficiency (%)	77.1%
CO Emissions (g/min)	1.52

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: 83 / Max: 87	OK
Face Velocity	< 30 ft/min	7.8	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min: 71 / Max: 76	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	CHECK 10 MIN. INTERVAL PRO-RATES

B415.1 Efficiency Results

Manufacturer: Island's Stove Works
Model: 15-W06
Date: 05/18/20
Run: 3
Control #: 20-601
Test Duration: 544
Output Category: Low

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	72.0%	77.1%
Combustion Efficiency	95.6%	95.6%
Heat Transfer Efficiency	75.4%	80.6%

Output Rate (kJ/h)	19,439	18,440	(Btu/h)
Burn Rate (kg/h)	1.35	2.98	(lb/h)
Input (kJ/h)	26,981	25,595	(Btu/h)

Test Load Weight (dry kg)	12.26	27.01	dry lb
MC wet (%)	18.14		
MC dry (%)	22.17		
Particulate (g)	14.78		
CO (g)	829		
Test Duration (h)	9.07		

Emissions	Particulate	CO
g/MJ Output	0.08	4.70
g/kg Dry Fuel	1.21	67.60
g/h	1.63	91.38
g/min	0.03	1.52
lb/MM Btu Output	0.19	10.93

Air/Fuel Ratio (A/F)	18.80
-----------------------------	-------

VERSION:

2.2

12/14/2009

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking # 0071
 Technician: AK
 Date: 5/18/2020

Nominal Loading Density (lbs/ft³, wet basis): 10
 Usable Firebox Volume (ft³): 2.86
 Target Load Weight (lbs): **28.60**
 Total Load Weight Range (lbs): **27.20** to **30.00**
 Core Load Weight Range (lbs): 12.90 to 18.60
 Remainder Load Weight Range (lbs): 10.00 to 15.70
 Core Load Piece Range (lbs): **4.30** to **7.20**
 Remainder Load Piece Range (lbs): **2.90** to **15.70**
 Max Allowable Kindling Weight (lbs): 5.52
 Max Allowable Start-up Fuel Weight (lbs): 8.28

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		5.31	In Range	27.6	28.2	19.0	24.9	In Range	4.25	1.93	
2		5.51	In Range	16.9	24.2	28.0	23.0	In Range	4.48	2.03	
3		5.42	In Range	18.4	18.9	17.7	18.3	In Range	4.58	2.08	
Core Load Wt. (lbs)		16.24	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		3.86	In Range	17.2	21.5	19.9	19.5	In Range	3.23	1.46	
2		7.50	In Range	27.5	18.5	26.9	24.3	In Range	6.03	2.74	
3			NA				NA	NA	NA	NA	
Remainder Load (lbs)		11.36	In Range								

Total Load Weight (lbs): **27.60** 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: 97% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 9.7
 Total Load Average Moisture Content (%DB): **22.3** In Range 19-25%
 Total Load Average Moisture Content (%WB): 18.2
 Total Test Load Weight (dry basis): 22.57 lbs 10.24 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
4.20	In Range	10	10	10	10.0	In Range	3.82	1.73

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
7.22	In Range	20.1	22.4	18.7	20.4	In Range	6.00	2.72

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): **2.8** to **5.5**
 Actual Residual Start-up Fuel Weight (lb): **3.4** In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Nominal Loading Density (lbs/ft³, wet basis): 12
 Usable Firebox Volume (ft³): 2.86
 Target Load Weight (lbs): **34.32**
 Total Load Weight Range (lbs): **32.60** to **36.04**
 Core Load Weight Range (lbs): 15.44 to 22.31
 Remainder Load Weight Range (lbs): 12.01 to 18.88
 Core Load Piece Range (lbs): **5.15** to **8.58**
 Remainder Load Piece Range (lbs): **3.43** to **10.30**

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		6.56	In Range	18.8	19.0	20.4	19.4	In Range	5.49	2.49
2		6.24	In Range	18.9	19.5	27.6	22.0	In Range	5.11	2.32
3		6.38	In Range	24.9	26.5	23.6	25.0	In Range	5.10	2.32
Core Load Wt. (lbs)		19.18	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		3.82	In Range	20.6	22.8	20.2	21.2	In Range	3.15	1.43
2		6.40	In Range	24.2	24.9	24.3	24.5	In Range	5.14	2.33
3		4.41	In Range	20.0	21.0	19.6	20.2	In Range	3.67	1.66
Remainder Load (lbs)		14.63	In Range							

Remainder Load Small/Large Piece Weight Ratio: 60% In Range ≤ 67%
 Total Load Weight (lbs): **33.81** In Range
 Core Load % of Total Weight: 57% In Range 45-65%
 Remainder % of Total Weight: 43% In Range 35-55%
 Total Load % of Target Weight: 99% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 11.8
 Total Load Average Moisture Content (%DB): 22.2 In Range 19-25%
 Total Load Average Moisture Content (%WB): 18.1
 Total Test Load Weight (dry basis): 27.68 lbs 12.55 kg

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 3.4 to 6.7
 Actual Charcoal Bed Wt. (lb): 6.0 In Range

TEST END POINT

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

Total Fuel Burned During Test Run: 33.8 lbs, wet basis
 27.7 lbs, dry basis
 12.55 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: England's Stove Works

Model: 15-W06

Run #: 3

Test Start Time: 13:43

Test Type: Low Fire

Job #: 20-601

Tracking #: 0071

Technician: AK

Date: 5/18/2020

Recording Interval (min): 1

Total Sampling Time (min): 544

Meter Box γ Factor: 1.012 (A)Meter Box γ Factor: 1.008 (B)Meter Box γ Factor: (Ambient)Induced Draft Check (in. H₂O): 0

Smoke Capture Check (%): 100%

Date Flue Pipe Last Cleaned: 5/14/2020

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.86	29.99	29.93
Relative Humidity (%)	27.0	39.0	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:			ft ³

Sample Train Post-Test Leak Checks

(A) 0.000 cfm @ -5 in. Hg

(B) 0.001 cfm @ -10 in. Hg

(Ambient) cfm @ in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.034	130
2	0.074	130
3	0.076	130
4	0.060	130
5	0.036	130
6	0.076	130
7	0.078	130
8	0.036	130
Center	0.082	130

Dilution Tunnel H₂O: 2.00 percent

Tunnel Diameter: 6 inches

Pitot Tube Cp: 0.99 [unitless]

Dilution Tunnel MW(dry): 29.00 lb/lb-mole

Dilution Tunnel MW(wet): 28.78 lb/lb-mole

Tunnel Area: 0.1963 ft²V_{strav}: 17.13 ft/secV_{scnt}: 20.09 ft/secF_p: 0.853 [ratio]

Initial Tunnel Flow: 172.9 scf/min

Static Pressure: -0.200 in. H₂O

TEST FUEL PROPERTIES

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

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

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.084	0.02	78	-0.08		33.0		117	403	84	74
1	0.121	0.121	0.073	1.77	78	-0.6	104	33.0	0	133	359	84	74
2	0.251	0.130	0.073	1.77	78	-0.9	110	33.0	0	124	368	85	74
3	0.387	0.136	0.074	1.77	78	-0.78	115	32.8	-0.2	123	383	85	73
4	0.516	0.129	0.077	1.80	78	-0.87	107	32.6	-0.2	124	401	85	73
5	0.646	0.130	0.089	1.74	78	-0.61	100	32.3	-0.3	123	411	85	73
6	0.779	0.133	0.076	1.73	78	-0.62	111	32.1	-0.2	123	432	85	73
7	0.906	0.127	0.083	1.75	78	-0.59	101	31.9	-0.2	125	453	85	73
8	1.035	0.129	0.086	1.75	78	-0.71	101	31.6	-0.3	128	474	85	73
9	1.168	0.133	0.076	1.73	79	-0.71	112	31.3	-0.3	136	552	86	73
10	1.295	0.127	0.087	1.72	79	-0.68	100	30.9	-0.4	137	569	86	73
11	1.422	0.127	0.081	1.70	79	-0.81	103	30.4	-0.5	138	573	86	73
12	1.555	0.133	0.072	1.71	79	-0.97	115	30.4	0	135	556	85	73
13	1.683	0.128	0.080	1.70	79	-0.83	104	30.0	-0.4	131	535	85	73
14	1.809	0.126	0.087	1.71	80	-0.9	98	29.7	-0.3	128	519	85	73
15	1.940	0.131	0.089	1.71	80	-0.8	101	29.5	-0.2	126	504	84	73
16	2.070	0.130	0.078	1.69	80	-0.82	107	29.2	-0.3	125	492	84	73
17	2.195	0.125	0.085	1.69	80	-1.08	98	29.1	-0.1	124	488	84	73
18	2.324	0.129	0.076	1.69	81	-0.92	107	28.9	-0.2	123	484	84	73
19	2.455	0.131	0.086	1.70	81	-1.13	102	28.6	-0.3	123	485	84	73
20	2.581	0.126	0.085	1.69	81	-0.78	99	28.6	0	122	486	84	73
21	2.709	0.128	0.091	1.68	81	-0.96	97	28.2	-0.4	122	485	84	73
22	2.839	0.130	0.082	1.68	82	-1.02	103	28.1	-0.1	123	484	84	73
23	2.965	0.126	0.071	1.67	82	-0.94	108	27.9	-0.2	122	481	84	73
24	3.093	0.128	0.084	1.68	82	-0.81	100	27.6	-0.3	122	480	84	72
25	3.223	0.130	0.092	1.67	82	-1.14	98	27.4	-0.2	122	479	84	72
26	3.350	0.127	0.082	1.67	83	-0.84	101	27.2	-0.2	122	477	84	72
27	3.477	0.127	0.078	1.68	83	-0.83	103	27.0	-0.2	122	477	84	72
28	3.607	0.130	0.082	1.65	83	-1.28	103	26.9	-0.1	122	478	84	72
29	3.735	0.128	0.087	1.67	84	-1.08	98	26.6	-0.3	122	480	84	73
30	3.860	0.125	0.086	1.67	84	-0.93	97	26.4	-0.2	122	483	84	72
31	3.990	0.130	0.080	1.65	84	-1.09	104	26.3	-0.1	122	484	84	72
32	4.120	0.130	0.088	1.67	84	-0.94	99	26.0	-0.3	122	486	84	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.245	0.125	0.081	1.67	85	-1.21	99	25.8	-0.2	122	487	84	72
34	4.373	0.128	0.077	1.66	85	-1.11	104	25.6	-0.2	122	488	84	73
35	4.503	0.130	0.088	1.66	85	-1.26	99	25.4	-0.2	122	491	84	73
36	4.630	0.127	0.076	1.83	86	-0.98	104	25.1	-0.3	122	492	84	73
37	4.759	0.129	0.077	1.69	86	-1.23	105	24.9	-0.2	122	492	84	72
38	4.890	0.131	0.077	1.69	86	-1.25	107	24.7	-0.2	123	490	84	72
39	5.017	0.127	0.086	1.69	87	-1.09	98	24.5	-0.2	122	482	84	73
40	5.146	0.129	0.078	1.71	87	-1.02	104	24.3	-0.2	123	486	84	73
41	5.277	0.131	0.086	1.69	87	-0.91	101	24.1	-0.2	122	487	84	72
42	5.405	0.128	0.080	1.69	87	-1.01	102	23.9	-0.2	122	485	84	72
43	5.534	0.129	0.081	1.75	88	-1.2	102	23.7	-0.2	121	481	84	72
44	5.667	0.133	0.076	1.74	88	-1.04	108	23.5	-0.2	121	477	84	73
45	5.795	0.128	0.087	1.72	88	-1.01	97	23.3	-0.2	120	473	84	72
46	5.926	0.131	0.080	1.74	88	-1.09	104	23.1	-0.2	120	468	84	72
47	6.058	0.132	0.080	1.73	89	-1.21	105	22.9	-0.2	119	463	84	72
48	6.187	0.129	0.077	1.71	89	-1	104	22.8	-0.1	119	459	84	73
49	6.318	0.131	0.075	1.75	89	-1.08	107	22.6	-0.2	119	456	84	72
50	6.450	0.132	0.086	1.72	89	-0.99	101	22.4	-0.2	118	453	84	72
51	6.580	0.130	0.081	1.72	90	-1.04	102	22.3	-0.1	117	450	84	72
52	6.711	0.131	0.089	1.71	90	-0.98	98	22.1	-0.2	118	448	84	72
53	6.844	0.133	0.078	1.73	90	-1.23	106	21.9	-0.2	117	447	84	72
54	6.973	0.129	0.090	1.73	90	-1.21	96	21.7	-0.2	117	445	84	72
55	7.104	0.131	0.085	1.75	90	-1.24	100	21.6	-0.1	117	445	84	73
56	7.236	0.132	0.075	1.72	91	-1.11	107	21.4	-0.2	117	447	84	72
57	7.366	0.130	0.077	1.75	91	-0.93	104	21.2	-0.2	116	448	84	73
58	7.497	0.131	0.069	1.71	91	-1.32	111	21.0	-0.2	117	450	84	72
59	7.630	0.133	0.078	1.71	91	-1.04	106	20.9	-0.1	117	452	84	73
60	7.760	0.130	0.080	1.74	91	-0.92	102	20.8	-0.1	117	456	84	73
61	7.890	0.130	0.085	1.70	91	-1.4	99	20.5	-0.3	118	460	84	73
62	8.026	0.136	0.078	2.20	92	-0.78	108	20.3	-0.2	117	458	83	73
63	8.165	0.139	0.077	2.04	92	-0.73	111	20.2	-0.1	117	452	83	72
64	8.311	0.146	0.078	2.03	92	-0.56	116	20.1	-0.1	116	449	84	73
65	8.450	0.139	0.078	2.06	92	-0.98	111	19.9	-0.2	116	448	84	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	8.596	0.146	0.086	2.04	92	-0.93	111	19.7	-0.2	116	446	84	72
67	8.736	0.140	0.073	2.05	93	-0.49	115	19.5	-0.2	116	446	84	72
68	8.880	0.144	0.075	2.04	93	-0.53	117	19.4	-0.1	116	444	84	73
69	9.021	0.141	0.088	2.05	93	-0.66	105	19.2	-0.2	116	441	84	73
70	9.134	0.113	0.089	1.36	93	-0.82	84	19.0	-0.2	116	441	84	72
71	9.260	0.126	0.071	1.72	93	-0.67	105	18.9	-0.1	115	439	84	72
72	9.393	0.133	0.078	1.69	93	-0.58	106	18.7	-0.2	115	439	84	72
73	9.521	0.128	0.074	1.69	93	-0.43	104	18.6	-0.1	114	429	84	72
74	9.651	0.130	0.082	1.69	94	-0.86	100	18.5	-0.1	113	422	84	72
75	9.784	0.133	0.077	1.69	94	-0.63	106	18.2	-0.3	113	416	84	72
76	9.913	0.129	0.075	1.71	94	-0.79	104	18.2	0	112	414	84	72
77	10.043	0.130	0.080	1.71	94	-0.74	101	18.0	-0.2	111	410	84	72
78	10.176	0.133	0.092	1.71	94	-0.74	97	17.9	-0.1	111	407	84	72
79	10.305	0.129	0.068	1.71	94	-0.73	109	17.8	-0.1	110	402	84	72
80	10.435	0.130	0.077	1.69	94	-0.65	103	17.7	-0.1	110	397	84	72
81	10.569	0.134	0.081	1.71	94	-0.71	104	17.5	-0.2	109	394	84	72
82	10.697	0.128	0.086	1.74	94	-0.63	96	17.3	-0.2	109	391	84	72
83	10.828	0.131	0.086	1.71	95	-0.4	98	17.3	0	109	389	84	72
84	10.961	0.133	0.080	1.73	95	-0.72	103	17.2	-0.1	108	388	84	72
85	11.089	0.128	0.077	1.71	95	-0.57	101	17.0	-0.2	108	388	84	72
86	11.222	0.133	0.071	1.72	95	-0.48	110	16.8	-0.2	108	389	84	72
87	11.355	0.133	0.088	1.71	95	-0.51	98	16.8	0	108	388	84	72
88	11.483	0.128	0.080	1.71	95	-0.71	99	16.7	-0.1	108	388	84	72
89	11.617	0.134	0.076	1.73	95	-0.5	107	16.6	-0.1	108	388	84	72
90	11.749	0.132	0.087	1.74	95	-0.69	98	16.4	-0.2	107	389	84	72
91	11.876	0.127	0.076	1.71	95	-0.29	101	16.3	-0.1	107	389	84	72
92	12.011	0.135	0.075	1.74	96	-0.44	108	16.2	-0.1	107	390	84	71
93	12.142	0.131	0.078	1.72	96	-0.78	103	16.0	-0.2	107	393	84	72
94	12.271	0.129	0.084	1.72	96	-0.6	98	15.9	-0.1	108	397	84	72
95	12.406	0.135	0.083	1.70	96	-0.64	103	15.8	-0.1	108	398	84	72
96	12.535	0.129	0.092	1.72	96	-0.81	93	15.7	-0.1	108	397	84	72
97	12.665	0.130	0.080	1.72	96	-0.9	101	15.4	-0.3	108	395	84	71
98	12.800	0.135	0.089	1.74	96	-0.65	99	15.4	0	108	395	84	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	12.929	0.129	0.078	1.73	96	-0.59	101	15.3	-0.1	107	394	84	71
100	13.060	0.131	0.082	1.72	96	-0.44	100	15.1	-0.2	107	394	84	72
101	13.193	0.133	0.084	1.73	96	-0.5	101	15.0	-0.1	108	395	84	72
102	13.323	0.130	0.075	1.72	96	-0.68	104	14.9	-0.1	108	395	84	72
103	13.455	0.132	0.087	1.71	96	-0.84	98	14.7	-0.2	108	395	84	72
104	13.587	0.132	0.087	1.73	96	-0.84	98	14.6	-0.1	108	397	84	72
105	13.718	0.131	0.083	1.74	96	-0.93	100	14.5	-0.1	108	397	84	71
106	13.849	0.131	0.074	1.73	96	-0.76	106	14.3	-0.2	108	398	84	72
107	13.982	0.133	0.087	1.72	97	-0.63	99	14.2	-0.1	108	400	84	71
108	14.112	0.130	0.091	1.71	97	-0.62	94	14.1	-0.1	108	400	84	72
109	14.243	0.131	0.075	1.72	97	-0.91	105	14.0	-0.1	108	400	84	72
110	14.377	0.134	0.079	1.73	97	-0.72	104	13.8	-0.2	108	399	84	72
111	14.507	0.130	0.086	1.72	97	-0.74	97	13.7	-0.1	108	398	84	72
112	14.638	0.131	0.075	1.72	97	-0.53	105	13.6	-0.1	107	398	84	71
113	14.772	0.134	0.079	1.75	97	-0.64	104	13.3	-0.3	107	396	84	72
114	14.901	0.129	0.077	1.74	97	-0.53	102	13.4	0.1	107	395	84	71
115	15.034	0.133	0.088	1.72	97	-0.57	98	13.3	-0.1	107	395	84	72
116	15.168	0.134	0.082	1.77	97	-0.53	102	13.0	-0.3	107	393	84	72
117	15.296	0.128	0.086	1.73	97	-0.62	95	13.0	0	107	392	84	72
118	15.430	0.134	0.088	1.75	97	-0.47	99	12.9	-0.1	108	391	84	72
119	15.561	0.131	0.086	1.74	97	-0.75	98	12.8	-0.1	108	390	84	73
120	15.691	0.130	0.083	1.74	97	-0.48	99	12.7	-0.1	108	390	84	73
121	15.826	0.135	0.072	1.72	97	-0.58	110	12.6	-0.1	108	389	84	73
122	15.956	0.130	0.078	1.74	97	-0.87	102	12.5	-0.1	108	389	84	73
123	16.087	0.131	0.077	1.73	97	-0.5	103	12.4	-0.1	108	389	84	74
124	16.221	0.134	0.076	1.75	97	-0.57	106	12.3	-0.1	108	387	85	74
125	16.351	0.130	0.074	1.71	97	-0.82	105	12.2	-0.1	108	387	85	74
126	16.482	0.131	0.085	1.73	97	-0.63	98	12.1	-0.1	108	387	85	74
127	16.616	0.134	0.076	1.75	97	-0.76	106	11.9	-0.2	109	386	85	74
128	16.746	0.130	0.074	1.70	97	-0.8	105	11.9	0	109	385	85	75
129	16.878	0.132	0.076	1.73	97	-0.5	105	11.8	-0.1	108	384	85	75
130	17.011	0.133	0.076	1.74	98	-0.54	105	11.5	-0.3	108	383	85	75
131	17.141	0.130	0.078	1.72	98	-0.41	102	11.4	-0.1	108	383	85	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	17.272	0.131	0.078	1.72	98	-0.55	102	11.4	0	108	384	85	74
133	17.407	0.135	0.081	1.73	98	-0.96	104	11.3	-0.1	108	385	85	74
134	17.537	0.130	0.090	1.73	98	-0.83	95	11.1	-0.2	108	386	85	74
135	17.668	0.131	0.085	1.72	98	-0.54	98	11.1	0	108	385	84	73
136	17.802	0.134	0.076	1.71	98	-0.69	106	11.0	-0.1	108	385	84	74
137	17.931	0.129	0.090	1.70	98	-0.93	94	10.9	-0.1	108	385	84	74
138	18.065	0.134	0.074	1.71	98	-0.6	107	10.7	-0.2	107	384	84	73
139	18.198	0.133	0.085	1.68	98	-0.49	100	10.7	0	107	385	84	74
140	18.326	0.128	0.082	1.70	98	-0.65	98	10.6	-0.1	107	383	84	74
141	18.462	0.136	0.087	1.69	98	-0.89	101	10.5	-0.1	107	383	84	75
142	18.592	0.130	0.087	1.73	98	-0.79	96	10.4	-0.1	107	383	84	75
143	18.723	0.131	0.076	1.74	98	-0.78	104	10.2	-0.2	107	380	85	75
144	18.858	0.135	0.081	1.73	98	-0.82	104	10.3	0.1	108	375	85	75
145	18.988	0.130	0.085	1.72	98	-0.88	97	10.1	-0.2	107	370	85	75
146	19.119	0.131	0.079	1.73	98	-0.93	102	10.0	-0.1	106	364	84	75
147	19.253	0.134	0.079	1.71	98	-0.85	104	9.9	-0.1	106	358	84	75
148	19.384	0.131	0.089	1.73	98	-0.62	96	9.8	-0.1	106	354	84	75
149	19.515	0.131	0.089	1.73	98	-0.8	96	9.8	0	106	351	85	76
150	19.648	0.133	0.082	1.71	98	-0.81	101	9.7	-0.1	105	347	85	75
151	19.779	0.131	0.081	1.72	99	-0.59	100	9.6	-0.1	105	346	85	76
152	19.910	0.131	0.081	1.71	99	-0.67	100	9.6	0	105	344	85	76
153	20.045	0.135	0.066	1.74	99	-0.73	114	9.5	-0.1	104	344	85	76
154	20.175	0.130	0.078	1.72	99	-0.71	101	9.3	-0.2	104	343	84	76
155	20.306	0.131	0.083	1.72	99	-0.67	99	9.3	0	104	343	85	76
156	20.441	0.135	0.081	1.73	99	-0.65	103	9.3	0	104	342	85	76
157	20.570	0.129	0.086	1.70	99	-0.78	96	9.2	-0.1	104	342	85	76
158	20.704	0.134	0.074	1.72	99	-0.6	107	9.1	-0.1	104	342	85	76
159	20.837	0.133	0.090	1.72	99	-0.59	96	8.9	-0.2	104	341	85	76
160	20.965	0.128	0.080	1.70	99	-0.99	98	9.0	0.1	104	340	85	76
161	21.101	0.136	0.079	1.71	99	-0.45	105	8.8	-0.2	104	341	85	76
162	21.232	0.131	0.078	1.72	99	-0.55	102	8.8	0	104	342	85	76
163	21.362	0.130	0.076	1.70	99	-0.85	102	8.6	-0.2	104	342	85	76
164	21.498	0.136	0.081	1.73	99	-0.78	104	8.7	0.1	104	342	85	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	21.627	0.129	0.077	1.71	99	-0.83	101	8.6	-0.1	104	342	85	76
166	21.759	0.132	0.088	1.73	99	-0.55	97	8.5	-0.1	104	343	85	76
167	21.893	0.134	0.092	1.74	99	-0.58	96	8.3	-0.2	104	344	85	76
168	22.024	0.131	0.085	1.73	99	-0.85	98	8.3	0	104	346	85	76
169	22.156	0.132	0.082	1.72	99	-0.86	100	8.3	0	104	348	85	76
170	22.289	0.133	0.086	1.71	99	-0.66	99	8.2	-0.1	104	350	85	76
171	22.421	0.132	0.087	1.70	99	-0.55	97	8.1	-0.1	104	351	85	76
172	22.552	0.131	0.079	1.71	99	-0.75	101	8.0	-0.1	104	350	85	76
173	22.687	0.135	0.087	1.73	99	-0.68	99	8.0	0	104	343	85	76
174	22.816	0.129	0.077	1.72	99	-0.83	101	7.9	-0.1	103	337	85	76
175	22.949	0.133	0.085	1.74	99	-0.52	99	7.9	0	103	333	85	76
176	23.084	0.135	0.093	1.74	99	-0.83	96	7.8	-0.1	103	330	85	76
177	23.212	0.128	0.081	1.72	100	-0.83	97	7.7	-0.1	103	327	85	76
178	23.347	0.135	0.087	1.73	100	-0.64	99	7.7	0	103	326	85	76
179	23.478	0.131	0.082	1.72	100	-0.54	99	7.5	-0.2	102	324	85	76
180	23.609	0.131	0.084	1.73	100	-0.67	98	7.6	0.1	102	323	85	76
181	23.744	0.135	0.084	1.71	100	-0.55	101	7.5	-0.1	102	321	84	76
182	23.874	0.130	0.084	1.72	100	-0.86	97	7.5	0	102	321	84	76
183	24.006	0.132	0.090	1.74	100	-0.93	95	7.4	-0.1	102	321	85	76
184	24.140	0.134	0.076	1.71	100	-0.75	105	7.3	-0.1	102	322	85	76
185	24.271	0.131	0.078	1.73	100	-0.6	102	7.3	0	102	324	84	76
186	24.403	0.132	0.088	1.74	100	-0.81	96	7.2	-0.1	101	322	84	76
187	24.537	0.134	0.086	1.69	100	-0.45	99	7.2	0	101	311	84	76
188	24.668	0.131	0.089	1.69	100	-0.58	95	7.1	-0.1	100	300	84	76
189	24.800	0.132	0.078	1.71	100	-0.68	102	7.1	0	99	292	84	76
190	24.935	0.135	0.077	1.71	100	-0.71	105	7.1	0	99	286	84	76
191	25.064	0.129	0.077	1.66	100	-0.79	100	7.1	0	98	284	84	76
192	25.198	0.134	0.077	1.68	100	-0.45	104	7.0	-0.1	98	280	84	76
193	25.332	0.134	0.074	1.70	100	-0.89	106	6.9	-0.1	98	280	84	76
194	25.460	0.128	0.087	1.71	100	-0.78	93	7.0	0.1	97	276	84	76
195	25.596	0.136	0.085	1.72	100	-0.77	101	7.0	0	97	275	84	76
196	25.728	0.132	0.078	1.72	100	-0.41	102	6.9	-0.1	97	273	84	76
197	25.859	0.131	0.083	1.70	100	-0.82	98	6.9	0	97	270	84	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	25.994	0.135	0.073	1.71	100	-0.35	108	6.9	0	96	268	84	76
199	26.124	0.130	0.075	1.71	100	-0.95	102	6.8	-0.1	96	266	84	76
200	26.257	0.133	0.087	1.72	100	-0.52	97	6.8	0	96	261	84	76
201	26.391	0.134	0.074	1.72	100	-0.54	106	6.8	0	95	259	84	76
202	26.522	0.131	0.087	1.71	100	-0.72	96	6.8	0	95	256	84	76
203	26.654	0.132	0.088	1.70	100	-0.77	96	6.7	-0.1	95	255	84	76
204	26.789	0.135	0.082	1.70	100	-0.7	101	6.6	-0.1	95	253	84	76
205	26.919	0.130	0.074	1.72	100	-0.78	103	6.7	0.1	94	252	84	76
206	27.052	0.133	0.080	1.70	100	-0.81	101	6.7	0	94	251	84	76
207	27.187	0.135	0.076	1.70	100	-0.64	105	6.6	-0.1	94	249	84	76
208	27.316	0.129	0.077	1.72	100	-0.88	100	6.6	0	94	247	84	76
209	27.451	0.135	0.071	1.73	100	-0.87	109	6.5	-0.1	94	246	84	76
210	27.583	0.132	0.076	1.73	100	-0.92	103	6.6	0.1	94	245	84	76
211	27.714	0.131	0.086	1.74	100	-0.86	96	6.5	-0.1	93	242	84	76
212	27.849	0.135	0.091	1.73	100	-0.5	96	6.6	0.1	93	241	84	76
213	27.979	0.130	0.082	1.72	100	-0.6	97	6.5	-0.1	93	240	84	76
214	28.112	0.133	0.077	1.71	100	-0.68	103	6.4	-0.1	92	237	84	76
215	28.246	0.134	0.087	1.72	100	-0.66	97	6.3	-0.1	92	236	84	76
216	28.378	0.132	0.089	1.71	100	-0.66	95	6.4	0.1	92	235	84	75
217	28.509	0.131	0.074	1.72	100	-0.77	103	6.4	0	92	234	84	76
218	28.644	0.135	0.080	1.71	100	-0.7	102	6.3	-0.1	92	232	84	76
219	28.775	0.131	0.082	1.72	100	-0.8	98	6.3	0	91	232	84	75
220	28.907	0.132	0.076	1.70	100	-0.7	103	6.3	0	91	230	84	75
221	29.042	0.135	0.083	1.68	100	-0.65	100	6.3	0	91	230	84	75
222	29.172	0.130	0.082	1.71	100	-0.55	97	6.3	0	91	229	84	75
223	29.307	0.135	0.080	1.69	100	-0.99	102	6.2	-0.1	91	228	84	75
224	29.439	0.132	0.081	1.70	100	-0.8	99	6.2	0	91	227	84	75
225	29.569	0.130	0.083	1.70	100	-0.69	97	6.1	-0.1	91	227	84	75
226	29.705	0.136	0.078	1.72	100	-0.57	104	6.3	0.2	90	226	84	75
227	29.835	0.130	0.083	1.70	100	-0.73	97	6.1	-0.2	90	226	84	75
228	29.967	0.132	0.078	1.70	100	-0.57	101	6.1	0	90	226	84	75
229	30.102	0.135	0.080	1.70	100	-0.68	102	6.1	0	90	225	84	75
230	30.233	0.131	0.090	1.69	100	-0.58	93	6.0	-0.1	90	225	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	30.364	0.131	0.073	1.70	100	-0.8	104	6.1	0.1	90	224	84	75
232	30.499	0.135	0.083	1.69	100	-0.78	100	5.9	-0.2	90	224	84	75
233	30.630	0.131	0.086	1.70	100	-0.63	96	5.9	0	90	224	84	75
234	30.762	0.132	0.079	1.71	100	-0.51	100	6.0	0.1	89	223	84	75
235	30.897	0.135	0.083	1.72	100	-0.79	100	6.0	0	90	224	84	75
236	31.026	0.129	0.070	1.71	100	-0.49	104	5.9	-0.1	89	224	84	75
237	31.161	0.135	0.083	1.74	100	-0.5	100	5.9	0	90	223	84	75
238	31.294	0.133	0.085	1.72	100	-0.62	98	5.9	0	89	223	84	75
239	31.423	0.129	0.071	1.71	100	-0.74	104	5.9	0	89	223	84	75
240	31.559	0.136	0.084	1.73	100	-0.73	100	5.8	-0.1	89	222	84	75
241	31.690	0.131	0.084	1.72	100	-0.65	97	5.8	0	89	222	84	75
242	31.822	0.132	0.074	1.73	100	-0.68	104	5.8	0	89	223	84	75
243	31.956	0.134	0.089	1.73	100	-0.85	96	5.8	0	89	222	84	75
244	32.088	0.132	0.083	1.72	100	-0.47	98	5.7	-0.1	89	223	84	75
245	32.220	0.132	0.076	1.72	100	-0.69	102	5.7	0	89	223	84	75
246	32.353	0.133	0.087	1.70	100	-0.91	96	5.6	-0.1	89	223	84	75
247	32.485	0.132	0.075	1.72	100	-0.71	103	5.7	0.1	89	223	84	75
248	32.616	0.131	0.083	1.75	100	-0.86	97	5.5	-0.2	89	222	84	75
249	32.752	0.136	0.084	1.74	100	-0.89	100	5.6	0.1	89	223	84	75
250	32.881	0.129	0.072	1.73	100	-0.67	103	5.6	0	89	222	84	75
251	33.014	0.133	0.085	1.72	100	-0.86	98	5.6	0	89	223	84	75
252	33.149	0.135	0.075	1.75	100	-0.56	105	5.5	-0.1	89	222	84	75
253	33.278	0.129	0.089	1.73	100	-0.55	92	5.5	0	89	222	84	75
254	33.413	0.135	0.079	1.73	100	-0.65	103	5.6	0.1	88	222	84	75
255	33.544	0.131	0.086	1.71	100	-0.7	96	5.4	-0.2	89	222	84	75
256	33.675	0.131	0.079	1.75	100	-0.9	100	5.5	0.1	89	222	84	75
257	33.811	0.136	0.089	1.73	100	-0.93	98	5.3	-0.2	89	222	84	75
258	33.941	0.130	0.083	1.71	100	-0.51	96	5.5	0.2	88	221	84	75
259	34.073	0.132	0.080	1.72	100	-0.43	100	5.4	-0.1	88	221	84	75
260	34.207	0.134	0.084	1.74	100	-0.84	99	5.4	0	88	221	84	74
261	34.338	0.131	0.073	1.72	100	-0.82	104	5.4	0	88	221	84	75
262	34.469	0.131	0.086	1.71	100	-0.79	95	5.3	-0.1	88	221	84	75
263	34.603	0.134	0.081	1.74	100	-1.01	101	5.4	0.1	88	221	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	34.735	0.132	0.075	1.72	100	-0.6	103	5.3	-0.1	88	221	84	75
265	34.866	0.131	0.086	1.73	100	-0.74	95	5.3	0	88	221	84	75
266	35.001	0.135	0.091	1.73	100	-0.57	96	5.3	0	88	221	84	75
267	35.130	0.129	0.078	1.75	100	-0.7	99	5.2	-0.1	88	221	84	75
268	35.264	0.134	0.078	1.71	100	-0.68	103	5.1	-0.1	88	221	84	75
269	35.398	0.134	0.083	1.75	100	-0.52	99	5.2	0.1	88	220	84	75
270	35.526	0.128	0.083	1.71	100	-0.86	95	5.2	0	88	220	84	74
271	35.662	0.136	0.076	1.74	100	-0.53	105	5.2	0	88	220	84	75
272	35.793	0.131	0.084	1.74	100	-0.59	97	5.1	-0.1	88	220	84	75
273	35.924	0.131	0.082	1.72	100	-0.4	98	5.1	0	88	220	84	74
274	36.059	0.135	0.083	1.73	100	-0.69	100	5.2	0.1	88	221	84	74
275	36.189	0.130	0.085	1.72	100	-0.66	95	5.1	-0.1	88	221	84	74
276	36.321	0.132	0.085	1.70	100	-0.5	97	5.0	-0.1	88	221	84	74
277	36.455	0.134	0.084	1.71	100	-0.77	99	5.0	0	88	221	84	74
278	36.586	0.131	0.090	1.75	100	-0.87	93	5.0	0	88	221	84	74
279	36.718	0.132	0.085	1.72	100	-0.4	97	5.0	0	88	221	84	74
280	36.852	0.134	0.090	1.71	100	-0.5	95	5.0	0	88	221	84	74
281	36.983	0.131	0.090	1.75	100	-0.71	93	5.0	0	88	221	84	74
282	37.114	0.131	0.089	1.73	100	-0.6	94	4.8	-0.2	88	221	84	74
283	37.249	0.135	0.090	1.71	100	-0.48	96	4.9	0.1	88	221	84	74
284	37.378	0.129	0.083	1.71	100	-0.61	96	4.9	0	87	221	84	74
285	37.512	0.134	0.083	1.74	100	-0.81	99	4.8	-0.1	88	221	84	74
286	37.646	0.134	0.085	1.72	100	-0.87	98	4.9	0.1	88	222	84	74
287	37.774	0.128	0.080	1.76	100	-0.67	97	4.8	-0.1	87	222	84	74
288	37.910	0.136	0.078	1.75	100	-0.73	104	4.8	0	87	223	83	74
289	38.041	0.131	0.088	1.73	100	-0.63	94	4.7	-0.1	88	223	84	74
290	38.171	0.130	0.090	1.72	100	-0.64	93	4.8	0.1	87	223	84	74
291	38.307	0.136	0.082	1.73	100	-0.66	101	4.6	-0.2	87	223	84	74
292	38.437	0.130	0.085	1.72	100	-0.63	95	4.7	0.1	87	223	84	74
293	38.569	0.132	0.079	1.72	100	-0.65	100	4.7	0	87	223	84	74
294	38.703	0.134	0.082	1.74	99	-0.81	100	4.7	0	88	223	84	74
295	38.834	0.131	0.089	1.74	99	-0.55	94	4.6	-0.1	88	223	84	74
296	38.965	0.131	0.086	1.74	99	-0.79	96	4.6	0	87	223	84	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	39.099	0.134	0.075	1.73	99	-0.83	105	4.6	0	87	223	84	74
298	39.230	0.131	0.088	1.70	99	-0.79	95	4.6	0	88	223	84	74
299	39.361	0.131	0.080	1.71	99	-0.69	99	4.5	-0.1	88	223	84	74
300	39.496	0.135	0.076	1.73	99	-0.43	105	4.6	0.1	87	223	84	74
301	39.625	0.129	0.088	1.72	99	-0.77	93	4.5	-0.1	88	223	84	74
302	39.759	0.134	0.087	1.73	99	-0.49	97	4.5	0	88	223	83	74
303	39.893	0.134	0.091	1.73	99	-0.92	95	4.4	-0.1	88	223	83	74
304	40.021	0.128	0.093	1.73	99	-0.79	90	4.5	0.1	87	223	83	74
305	40.156	0.135	0.080	1.72	99	-0.74	102	4.4	-0.1	87	223	83	74
306	40.288	0.132	0.076	1.69	99	-0.89	102	4.4	0	87	223	83	74
307	40.418	0.130	0.078	1.71	99	-0.64	100	4.4	0	88	223	83	74
308	40.554	0.136	0.078	1.72	99	-0.66	104	4.4	0	87	223	83	74
309	40.683	0.129	0.088	1.72	99	-0.9	93	4.4	0	87	224	83	74
310	40.815	0.132	0.075	1.71	99	-0.54	103	4.3	-0.1	87	224	83	73
311	40.949	0.134	0.082	1.71	99	-0.63	100	4.3	0	87	224	83	73
312	41.080	0.131	0.083	1.72	99	-0.51	97	4.3	0	87	224	83	74
313	41.211	0.131	0.072	1.73	99	-0.59	104	4.3	0	87	224	83	74
314	41.345	0.134	0.080	1.70	99	-0.83	101	4.2	-0.1	87	224	83	74
315	41.476	0.131	0.078	1.73	99	-0.75	100	4.2	0	87	224	83	73
316	41.607	0.131	0.077	1.74	99	-0.61	101	4.2	0	87	224	84	74
317	41.742	0.135	0.083	1.71	99	-0.53	100	4.2	0	87	224	84	73
318	41.872	0.130	0.083	1.69	99	-0.43	97	4.2	0	87	224	84	73
319	42.003	0.131	0.077	1.71	99	-0.48	101	4.1	-0.1	87	224	84	73
320	42.138	0.135	0.076	1.71	99	-0.75	105	4.1	0	87	224	84	73
321	42.267	0.129	0.084	1.72	99	-0.7	95	4.1	0	88	224	84	73
322	42.402	0.135	0.075	1.74	99	-0.7	105	4.1	0	87	224	84	74
323	42.534	0.132	0.087	1.70	99	-0.84	96	4.1	0	87	224	84	73
324	42.663	0.129	0.075	1.70	99	-0.51	101	4.1	0	87	224	83	73
325	42.798	0.135	0.077	1.72	99	-0.9	104	4.0	-0.1	87	224	83	73
326	42.929	0.131	0.089	1.73	99	-0.68	94	4.0	0	87	224	83	73
327	43.060	0.131	0.072	1.72	99	-0.9	104	4.0	0	87	224	83	73
328	43.194	0.134	0.088	1.74	99	-0.65	97	4.0	0	87	224	83	73
329	43.324	0.130	0.083	1.72	99	-0.65	97	4.0	0	87	225	83	73

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	43.456	0.132	0.074	1.70	99	-0.78	104	3.8	-0.2	87	225	83	73
331	43.590	0.134	0.084	1.70	99	-0.69	99	3.9	0.1	87	225	84	73
332	43.720	0.130	0.087	1.69	99	-0.8	94	3.9	0	87	225	83	73
333	43.851	0.131	0.074	1.73	99	-0.54	103	3.8	-0.1	87	225	83	73
334	43.985	0.134	0.079	1.74	99	-0.77	102	3.8	0	87	225	84	73
335	44.117	0.132	0.083	1.70	99	-0.83	98	3.8	0	87	224	83	73
336	44.247	0.130	0.091	1.71	99	-0.63	92	3.8	0	87	224	83	73
337	44.382	0.135	0.091	1.73	99	-0.77	96	3.7	-0.1	87	224	83	73
338	44.511	0.129	0.078	1.70	99	-0.61	99	3.8	0.1	87	224	83	73
339	44.644	0.133	0.087	1.70	99	-0.7	96	3.7	-0.1	87	224	83	73
340	44.778	0.134	0.082	1.71	99	-0.53	100	3.7	0	87	224	83	73
341	44.907	0.129	0.073	1.72	99	-0.59	102	3.7	0	87	224	83	73
342	45.041	0.134	0.076	1.71	99	-0.84	104	3.7	0	87	224	83	73
343	45.173	0.132	0.075	1.74	99	-0.73	103	3.7	0	87	224	83	73
344	45.302	0.129	0.075	1.73	99	-0.65	101	3.6	-0.1	87	224	83	73
345	45.438	0.136	0.080	1.73	99	-0.57	103	3.5	-0.1	87	224	83	73
346	45.568	0.130	0.082	1.68	99	-0.72	97	3.6	0.1	87	224	83	73
347	45.699	0.131	0.079	1.72	99	-0.83	100	3.6	0	87	224	83	73
348	45.833	0.134	0.080	1.75	99	-0.55	101	3.5	-0.1	87	224	83	73
349	45.964	0.131	0.084	1.74	99	-0.41	97	3.5	0	87	224	83	73
350	46.096	0.132	0.074	1.72	99	-0.58	104	3.5	0	87	224	83	73
351	46.229	0.133	0.083	1.71	99	-0.84	99	3.5	0	87	224	83	73
352	46.360	0.131	0.084	1.75	99	-0.7	97	3.4	-0.1	87	225	83	73
353	46.491	0.131	0.077	1.74	99	-0.96	101	3.4	0	87	226	83	73
354	46.626	0.135	0.081	1.69	99	-0.62	101	3.4	0	87	226	83	73
355	46.756	0.130	0.077	1.75	99	-0.88	100	3.4	0	87	226	83	73
356	46.887	0.131	0.093	1.73	99	-0.79	92	3.4	0	87	226	83	73
357	47.022	0.135	0.079	1.73	99	-0.84	103	3.2	-0.2	87	227	83	73
358	47.150	0.128	0.081	1.74	99	-0.81	96	3.3	0.1	87	227	83	73
359	47.284	0.134	0.086	1.71	99	-0.61	98	3.3	0	87	227	83	73
360	47.418	0.134	0.079	1.72	99	-0.72	102	3.3	0	87	227	83	73
361	47.546	0.128	0.086	1.72	99	-0.96	93	3.2	-0.1	87	227	83	72
362	47.681	0.135	0.082	1.71	99	-0.91	101	3.2	0	87	227	83	73

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363	47.812	0.131	0.085	1.72	99	-0.92	96	3.2	0	87	227	83	73
364	47.942	0.130	0.085	1.73	99	-0.55	95	3.2	0	87	227	83	73
365	48.078	0.136	0.076	1.75	99	-0.69	106	3.2	0	87	228	83	73
366	48.207	0.129	0.087	1.72	99	-0.98	94	3.1	-0.1	87	228	83	73
367	48.339	0.132	0.076	1.72	99	-0.91	102	3.1	0	87	228	83	73
368	48.472	0.133	0.074	1.72	99	-0.57	105	3.1	0	87	228	83	73
369	48.604	0.132	0.076	1.73	99	-0.63	102	3.1	0	87	228	83	73
370	48.735	0.131	0.090	1.73	99	-0.7	93	3.0	-0.1	87	228	83	73
371	48.868	0.133	0.079	1.73	99	-0.88	101	3.0	0	87	228	83	72
372	48.999	0.131	0.077	1.72	99	-0.8	101	3.0	0	87	228	83	72
373	49.130	0.131	0.083	1.73	99	-0.82	97	3.0	0	87	228	83	72
374	49.265	0.135	0.092	1.72	99	-0.59	95	3.0	0	87	228	83	73
375	49.395	0.130	0.084	1.73	99	-0.87	96	2.8	-0.2	87	228	83	73
376	49.526	0.131	0.076	1.72	99	-0.66	102	2.8	0	87	229	83	73
377	49.660	0.134	0.079	1.71	99	-0.5	102	2.9	0.1	87	229	83	72
378	49.789	0.129	0.087	1.71	99	-0.67	94	2.9	0	87	229	83	72
379	49.923	0.134	0.092	1.74	99	-0.75	94	2.9	0	87	229	83	72
380	50.056	0.133	0.079	1.72	99	-0.61	101	2.9	0	87	229	83	72
381	50.184	0.128	0.084	1.73	99	-0.78	94	2.8	-0.1	87	229	83	72
382	50.319	0.135	0.087	1.71	99	-0.5	98	2.8	0	87	228	83	72
383	50.450	0.131	0.086	1.71	99	-0.51	96	2.8	0	87	229	83	72
384	50.580	0.130	0.084	1.72	99	-0.41	96	2.8	0	87	229	83	72
385	50.716	0.136	0.077	1.69	99	-0.48	105	2.8	0	87	229	83	72
386	50.845	0.129	0.070	1.71	99	-0.67	104	2.7	-0.1	87	230	83	72
387	50.976	0.131	0.076	1.71	99	-0.6	102	2.7	0	87	229	83	72
388	51.110	0.134	0.088	1.73	99	-0.6	97	2.6	-0.1	87	229	83	72
389	51.240	0.130	0.089	1.71	99	-0.56	93	2.6	0	87	230	83	72
390	51.372	0.132	0.077	1.72	99	-0.55	102	2.6	0	87	230	83	72
391	51.505	0.133	0.081	1.74	99	-0.56	100	2.5	-0.1	87	230	83	72
392	51.636	0.131	0.079	1.71	99	-0.84	100	2.5	0	87	229	83	72
393	51.767	0.131	0.089	1.73	99	-0.6	94	2.6	0.1	87	230	83	72
394	51.900	0.133	0.090	1.71	99	-0.49	95	2.5	-0.1	87	229	83	72
395	52.031	0.131	0.078	1.71	99	-0.86	100	2.5	0	87	230	83	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396	52.162	0.131	0.075	1.74	99	-0.62	102	2.5	0	87	230	83	72
397	52.296	0.134	0.075	1.71	99	-0.82	105	2.5	0	87	229	83	72
398	52.426	0.130	0.074	1.75	99	-0.55	102	2.5	0	87	229	83	72
399	52.557	0.131	0.077	1.70	99	-0.72	101	2.5	0	87	229	83	72
400	52.691	0.134	0.074	1.73	99	-0.82	105	2.4	-0.1	87	229	83	72
401	52.819	0.128	0.076	1.72	99	-0.62	99	2.4	0	87	229	83	72
402	52.953	0.134	0.077	1.72	99	-0.57	103	2.4	0	86	229	83	72
403	53.086	0.133	0.082	1.74	99	-0.64	99	2.4	0	86	229	83	72
404	53.214	0.128	0.091	1.72	99	-0.79	91	2.4	0	86	228	83	72
405	53.349	0.135	0.083	1.74	99	-0.54	100	2.3	-0.1	87	228	83	72
406	53.480	0.131	0.085	1.73	99	-0.93	96	2.3	0	87	227	83	72
407	53.609	0.129	0.082	1.73	99	-0.45	96	2.3	0	87	227	83	72
408	53.745	0.136	0.081	1.74	99	-0.8	102	2.3	0	86	227	83	72
409	53.874	0.129	0.086	1.72	99	-0.65	94	2.2	-0.1	87	227	83	72
410	54.005	0.131	0.081	1.72	99	-0.64	98	2.2	0	87	227	83	72
411	54.139	0.134	0.087	1.73	99	-0.85	97	2.2	0	87	226	83	72
412	54.269	0.130	0.073	1.72	99	-0.81	103	2.2	0	87	226	83	72
413	54.400	0.131	0.082	1.73	99	-0.9	98	2.2	0	86	226	83	72
414	54.533	0.133	0.073	1.70	99	-0.6	105	2.2	0	86	226	83	72
415	54.663	0.130	0.071	1.72	99	-0.71	104	2.1	-0.1	86	225	83	72
416	54.795	0.132	0.085	1.73	99	-0.39	97	2.1	0	86	226	83	72
417	54.928	0.133	0.071	1.74	99	-0.47	107	2.1	0	86	226	83	72
418	55.058	0.130	0.078	1.75	99	-0.69	99	2.1	0	86	226	83	72
419	55.189	0.131	0.085	1.73	99	-0.67	96	2.2	0.1	86	226	83	72
420	55.323	0.134	0.083	1.72	99	-0.74	99	2.0	-0.2	86	225	83	72
421	55.453	0.130	0.078	1.70	99	-0.64	99	2.0	0	86	225	83	72
422	55.584	0.131	0.075	1.73	99	-0.74	102	2.0	0	86	225	83	72
423	55.718	0.134	0.072	1.72	99	-0.68	107	2.0	0	86	225	83	72
424	55.847	0.129	0.073	1.73	99	-0.77	102	2.1	0.1	86	225	83	72
425	55.979	0.132	0.075	1.70	99	-0.64	103	1.9	-0.2	86	224	83	72
426	56.113	0.134	0.083	1.71	99	-0.46	99	1.8	-0.1	86	224	83	72
427	56.241	0.128	0.076	1.73	99	-0.51	99	1.9	0.1	86	224	83	72
428	56.375	0.134	0.078	1.72	99	-0.56	103	1.8	-0.1	86	223	83	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
429	56.507	0.132	0.077	1.70	99	-0.69	102	1.9	0.1	86	223	83	72
430	56.635	0.128	0.081	1.74	99	-0.99	96	1.9	0	86	223	83	72
431	56.770	0.135	0.078	1.71	99	-0.66	103	1.8	-0.1	86	222	83	72
432	56.901	0.131	0.082	1.73	99	-0.59	98	1.8	0	86	222	83	72
433	57.030	0.129	0.092	1.69	99	-1.02	91	1.8	0	86	222	83	71
434	57.166	0.136	0.080	1.71	99	-0.69	103	1.8	0	86	222	83	71
435	57.295	0.129	0.075	1.71	99	-0.64	101	1.8	0	85	222	83	71
436	57.426	0.131	0.078	1.71	99	-0.67	100	1.8	0	85	222	83	72
437	57.559	0.133	0.084	1.72	99	-0.68	98	1.7	-0.1	86	222	83	72
438	57.689	0.130	0.081	1.69	99	-0.7	98	1.7	0	86	222	83	71
439	57.820	0.131	0.078	1.69	99	-0.81	100	1.7	0	86	221	83	71
440	57.954	0.134	0.082	1.71	99	-0.75	100	1.7	0	85	221	83	71
441	58.084	0.130	0.076	1.74	99	-0.83	101	1.6	-0.1	85	221	83	71
442	58.215	0.131	0.088	1.71	99	-0.66	94	1.6	0	85	221	83	71
443	58.348	0.133	0.078	1.67	99	-0.85	102	1.6	0	85	220	83	71
444	58.478	0.130	0.075	1.72	99	-0.56	101	1.6	0	86	220	83	71
445	58.609	0.131	0.087	1.72	99	-0.76	95	1.7	0.1	85	220	83	71
446	58.742	0.133	0.077	1.72	99	-0.86	102	1.6	-0.1	85	220	83	71
447	58.873	0.131	0.087	1.72	99	-0.54	95	1.5	-0.1	85	219	83	71
448	59.003	0.130	0.084	1.73	98	-0.67	96	1.5	0	85	219	83	71
449	59.138	0.135	0.093	1.71	99	-0.54	95	1.5	0	85	219	83	71
450	59.267	0.129	0.081	1.71	98	-0.7	97	1.5	0	85	219	83	71
451	59.398	0.131	0.089	1.71	99	-0.68	94	1.5	0	85	219	83	71
452	59.532	0.134	0.079	1.72	99	-0.79	102	1.5	0	85	219	83	71
453	59.660	0.128	0.085	1.71	99	-0.94	94	1.5	0	85	218	83	71
454	59.794	0.134	0.076	1.74	99	-0.77	104	1.5	0	85	218	83	71
455	59.927	0.133	0.075	1.71	99	-0.67	104	1.4	-0.1	85	218	83	71
456	60.055	0.128	0.074	1.71	98	-0.51	101	1.4	0	85	218	83	71
457	60.189	0.134	0.078	1.72	98	-0.66	103	1.3	-0.1	85	218	83	71
458	60.320	0.131	0.083	1.72	98	-0.54	97	1.4	0.1	85	217	83	71
459	60.449	0.129	0.088	1.71	98	-0.61	93	1.3	-0.1	85	217	83	71
460	60.584	0.135	0.071	1.72	98	-0.63	108	1.3	0	85	217	83	71
461	60.714	0.130	0.086	1.73	98	-0.43	95	1.3	0	85	217	83	71

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
462	60.844	0.130	0.090	1.74	98	-0.63	93	1.4	0.1	85	217	83	71
463	60.979	0.135	0.082	1.71	98	-0.54	101	1.2	-0.2	85	217	83	71
464	61.108	0.129	0.080	1.72	98	-0.78	98	1.2	0	85	217	83	71
465	61.238	0.130	0.089	1.72	98	-1.05	93	1.2	0	85	216	83	71
466	61.372	0.134	0.083	1.73	98	-0.77	99	1.2	0	85	216	83	71
467	61.502	0.130	0.074	1.71	98	-0.52	102	1.2	0	85	216	83	71
468	61.633	0.131	0.087	1.71	98	-0.74	95	1.2	0	85	215	83	71
469	61.767	0.134	0.076	1.71	98	-0.87	104	1.2	0	85	215	83	71
470	61.897	0.130	0.085	1.72	98	-0.5	95	1.1	-0.1	85	215	83	71
471	62.028	0.131	0.077	1.74	98	-0.8	101	1.1	0	85	215	83	71
472	62.160	0.132	0.076	1.74	98	-0.59	102	1.1	0	85	215	83	71
473	62.291	0.131	0.091	1.69	98	-0.74	93	1.1	0	85	215	83	71
474	62.421	0.130	0.081	1.72	98	-0.57	98	1.1	0	85	215	83	71
475	62.554	0.133	0.084	1.74	98	-0.94	98	1.2	0.1	85	214	83	71
476	62.684	0.130	0.076	1.73	98	-0.66	101	0.9	-0.3	84	215	83	71
477	62.815	0.131	0.075	1.72	98	-0.62	102	1.0	0.1	84	214	83	71
478	62.949	0.134	0.077	1.70	98	-0.81	103	1.0	0	84	214	83	71
479	63.078	0.129	0.075	1.72	98	-0.73	101	1.0	0	84	214	83	71
480	63.208	0.130	0.086	1.72	98	-0.77	95	1.0	0	84	214	83	71
481	63.342	0.134	0.092	1.73	98	-0.65	94	1.0	0	84	214	83	71
482	63.471	0.129	0.083	1.70	98	-0.74	96	1.0	0	84	213	83	71
483	63.603	0.132	0.074	1.71	98	-0.57	104	0.9	-0.1	85	213	83	71
484	63.737	0.134	0.088	1.72	98	-0.74	97	0.9	0	85	213	83	71
485	63.865	0.128	0.085	1.73	98	-0.61	94	0.9	0	85	212	83	71
486	63.998	0.133	0.086	1.72	98	-0.61	97	0.9	0	85	212	83	71
487	64.130	0.132	0.077	1.73	98	-0.64	102	0.9	0	85	212	83	71
488	64.258	0.128	0.086	1.73	98	-0.54	93	0.9	0	85	211	83	71
489	64.392	0.134	0.087	1.75	98	-0.68	97	0.8	-0.1	85	211	83	71
490	64.523	0.131	0.081	1.73	98	-0.7	98	0.7	-0.1	85	211	83	71
491	64.651	0.128	0.081	1.70	98	-0.68	96	0.8	0.1	84	211	83	71
492	64.786	0.135	0.081	1.73	98	-0.74	101	0.8	0	84	211	83	71
493	64.916	0.130	0.083	1.72	98	-0.75	96	0.8	0	84	211	83	71
494	65.045	0.129	0.074	1.72	98	-0.7	101	0.8	0	84	210	83	71

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
495	65.180	0.135	0.073	1.73	98	-0.45	107	0.7	-0.1	84	210	83	71
496	65.309	0.129	0.088	1.72	98	-0.81	93	0.7	0	84	210	83	71
497	65.439	0.130	0.081	1.73	98	-0.65	98	0.7	0	84	210	83	71
498	65.573	0.134	0.074	1.73	98	-0.59	105	0.7	0	84	210	83	71
499	65.702	0.129	0.073	1.71	98	-0.82	102	0.7	0	84	210	83	71
500	65.832	0.130	0.077	1.72	98	-0.46	100	0.6	-0.1	84	210	83	71
501	65.965	0.133	0.079	1.71	98	-0.85	101	0.5	-0.1	84	210	83	71
502	66.095	0.130	0.088	1.71	98	-0.75	94	0.5	0	84	210	83	71
503	66.225	0.130	0.075	1.71	98	-0.72	101	0.6	0.1	84	210	83	71
504	66.358	0.133	0.077	1.73	98	-0.63	102	0.6	0	84	210	83	71
505	66.488	0.130	0.086	1.73	98	-0.58	95	0.7	0.1	84	210	83	71
506	66.619	0.131	0.079	1.74	98	-0.77	100	0.6	-0.1	84	210	83	71
507	66.751	0.132	0.078	1.72	98	-0.91	101	0.6	0	83	210	83	71
508	66.881	0.130	0.078	1.70	98	-0.94	99	0.6	0	84	210	83	71
509	67.011	0.130	0.084	1.71	98	-0.97	96	0.5	-0.1	84	210	83	71
510	67.144	0.133	0.080	1.71	98	-0.84	100	0.5	0	84	209	83	71
511	67.274	0.130	0.080	1.72	98	-0.56	98	0.5	0	84	208	83	71
512	67.404	0.130	0.086	1.72	98	-0.71	95	0.6	0.1	84	208	83	71
513	67.536	0.132	0.085	1.71	98	-0.86	97	0.5	-0.1	84	207	83	71
514	67.666	0.130	0.080	1.72	98	-0.78	98	0.5	0	84	207	83	71
515	67.796	0.130	0.077	1.70	98	-0.45	100	0.4	-0.1	84	207	83	71
516	67.929	0.133	0.075	1.72	98	-0.93	104	0.5	0.1	84	206	83	71
517	68.059	0.130	0.080	1.73	98	-0.67	98	0.4	-0.1	84	206	83	71
518	68.189	0.130	0.071	1.73	98	-0.89	104	0.5	0.1	83	206	83	71
519	68.323	0.134	0.085	1.70	98	-0.81	98	0.4	-0.1	84	205	83	71
520	68.451	0.128	0.079	1.70	98	-0.66	97	0.4	0	83	205	83	71
521	68.581	0.130	0.081	1.71	98	-0.89	98	0.4	0	84	204	83	71
522	68.715	0.134	0.073	1.69	98	-0.68	106	0.3	-0.1	83	204	83	71
523	68.843	0.128	0.080	1.71	98	-0.77	97	0.3	0	83	203	83	71
524	68.974	0.131	0.079	1.70	98	-0.6	100	0.3	0	83	203	83	71
525	69.108	0.134	0.072	1.71	98	-0.82	107	0.3	0	83	203	83	71
526	69.236	0.128	0.092	1.69	98	-0.49	90	0.3	0	83	202	83	71
527	69.367	0.131	0.086	1.68	98	-0.84	95	0.3	0	83	202	83	71

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
528	69.500	0.133	0.073	1.70	98	-0.48	105	0.3	0	83	202	83	71
529	69.628	0.128	0.082	1.73	98	-0.66	95	0.2	-0.1	83	202	83	71
530	69.760	0.132	0.086	1.70	98	-0.42	96	0.2	0	83	202	83	71
531	69.893	0.133	0.084	1.69	98	-1.1	98	0.1	-0.1	83	202	83	71
532	70.021	0.128	0.085	1.70	98	-0.72	94	0.2	0.1	83	201	83	71
533	70.153	0.132	0.084	1.73	98	-0.82	97	0.2	0	83	201	83	71
534	70.286	0.133	0.078	1.71	98	-0.76	102	0.2	0	83	201	83	71
535	70.413	0.127	0.076	1.71	98	-0.6	98	0.1	-0.1	83	201	83	71
536	70.546	0.133	0.085	1.72	98	-0.74	97	0.1	0	83	200	83	71
537	70.678	0.132	0.087	1.71	98	-0.74	96	0.1	0	83	200	83	71
538	70.805	0.127	0.086	1.69	98	-0.64	92	0.1	0	83	200	83	71
539	70.939	0.134	0.083	1.71	98	-0.78	99	0.1	0	83	200	83	71
540	71.070	0.131	0.076	1.69	98	-0.88	101	0.1	0	83	200	83	71
541	71.198	0.128	0.080	1.69	98	-0.64	97	0.1	0	83	199	83	71
542	71.332	0.134	0.081	1.71	98	-0.89	101	0.1	0	83	199	83	71
543	71.462	0.130	0.089	1.72	98	-0.63	93	0.1	0	83	199	83	71
544	71.590	0.128	0.085	1.69	98	-0.52	94	0.0	-0.1	83	198	83	71
Avg/Tot	71.590	0.132	0.081	1.72	97	-0.72	100			96	288	84	73.0

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	0.000		0.00	78	-1		87	0.000	4.71	0.32
1	0.122	0.122	1.76	78	-0.15	111	87	-0.070	2.80	0.26
2	0.251	0.129	1.77	78	-3.08	117	87	-0.060	3.27	0.40
3	0.380	0.129	1.76	78	-1.56	116	87	-0.060	3.62	0.47
4	0.510	0.130	1.75	78	-0.04	114	87	-0.060	4.62	0.46
5	0.639	0.129	1.76	78	-1.03	105	87	-0.070	5.92	0.58
6	0.766	0.127	1.73	78	-0.44	112	87	-0.070	6.64	0.60
7	0.897	0.131	1.74	78	-0.01	111	87	-0.060	7.53	0.49
8	1.024	0.127	1.73	79	-1.24	106	87	-0.070	7.59	0.50
9	1.152	0.128	1.72	79	-3.25	114	87	-0.070	12.19	0.63
10	1.281	0.129	1.72	79	0	108	87	-0.080	13.38	1.04
11	1.409	0.128	1.71	79	-1.74	111	87	-0.080	13.05	0.78
12	1.533	0.124	1.70	79	0	114	86	-0.080	12.88	0.71
13	1.661	0.128	1.74	79	-0.13	111	86	-0.080	13.23	1.25
14	1.792	0.131	1.74	80	0	108	86	-0.070	11.81	0.80
15	1.919	0.127	1.74	80	-0.8	104	86	-0.080	10.77	0.56
16	2.046	0.127	1.72	80	-1.14	111	86	-0.080	10.13	0.52
17	2.176	0.130	1.72	80	-2.4	108	86	-0.070	10.05	0.55
18	2.304	0.128	1.72	81	-0.24	113	86	-0.070	10.03	0.51
19	2.431	0.127	1.71	81	-3.37	105	86	-0.070	10.01	0.54
20	2.560	0.129	1.72	81	-1.82	107	86	-0.070	10.22	0.54
21	2.686	0.126	1.70	82	-0.19	101	86	-0.070	10.30	0.51
22	2.813	0.127	1.70	82	-0.51	107	86	-0.060	10.10	0.49
23	2.942	0.129	1.70	82	-0.45	117	86	-0.080	9.91	0.47
24	3.070	0.128	1.68	82	-3.12	107	87	-0.070	9.87	0.48
25	3.195	0.125	1.70	83	0	100	86	-0.070	9.93	0.49
26	3.323	0.128	1.68	83	0	108	86	-0.070	9.88	0.48
27	3.453	0.130	1.68	83	-0.4	112	86	-0.070	10.09	0.45
28	3.578	0.125	1.68	84	-1.51	105	86	-0.070	10.18	0.44
29	3.705	0.127	1.68	84	-3.39	104	86	-0.070	10.18	0.46
30	3.834	0.129	1.69	84	-3.46	106	86	-0.070	10.33	0.45
31	3.960	0.126	1.67	85	-0.07	107	86	-0.080	10.42	0.46

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	4.086	0.126	1.68	85	-0.83	102	86	-0.080	10.40	0.42
33	4.215	0.129	1.67	85	-0.04	109	86	-0.070	10.69	0.43
34	4.342	0.127	1.68	86	-1.56	110	86	-0.070	10.69	0.43
35	4.467	0.125	1.68	86	-0.65	101	86	-0.080	10.74	0.42
36	4.594	0.127	1.66	86	-1.66	111	86	-0.070	10.75	0.44
37	4.723	0.129	1.67	86	-3.37	112	86	-0.070	10.69	0.45
38	4.849	0.126	1.68	87	-0.62	109	86	-0.070	10.63	0.48
39	4.975	0.126	1.67	87	-3.38	103	86	-0.070	10.31	0.47
40	5.103	0.128	1.66	87	-3.39	110	86	-0.070	10.94	0.34
41	5.229	0.126	1.65	88	-0.51	103	86	-0.070	11.03	0.33
42	5.366	0.137	1.57	88	-0.58	116	86	-0.060	10.87	0.27
43	5.498	0.132	1.75	88	-3.47	111	86	-0.070	10.56	0.27
44	5.628	0.130	1.74	89	-2.53	113	86	-0.070	10.21	0.26
45	5.757	0.129	1.74	89	-3.48	104	86	-0.070	10.10	0.27
46	5.888	0.131	1.74	89	-0.51	110	86	-0.070	9.86	0.26
47	6.019	0.131	1.74	89	-3.47	110	86	-0.070	9.63	0.25
48	6.148	0.129	1.75	90	-2.76	111	86	-0.070	9.49	0.28
49	6.279	0.131	1.74	90	-0.14	114	86	-0.080	9.26	0.28
50	6.410	0.131	1.75	90	-3.1	106	86	-0.070	9.31	0.30
51	6.539	0.129	1.74	90	-0.82	108	86	-0.060	9.25	0.30
52	6.671	0.132	1.75	91	-2.44	105	86	-0.060	9.20	0.32
53	6.801	0.130	1.75	91	-0.99	110	86	-0.070	9.23	0.31
54	6.930	0.129	1.73	91	-3.24	102	86	-0.070	9.21	0.33
55	7.063	0.133	1.73	91	-3.41	108	86	-0.070	9.28	0.33
56	7.194	0.131	1.76	92	-3.09	113	86	-0.080	9.43	0.32
57	7.324	0.130	1.75	92	-3	111	86	-0.070	9.65	0.31
58	7.458	0.134	1.76	92	-0.21	121	86	-0.070	9.78	0.28
59	7.588	0.130	1.77	92	-0.73	110	86	-0.070	9.98	0.27
60	7.718	0.130	1.75	93	-0.21	109	86	-0.060	10.15	0.24
61	7.852	0.134	1.76	93	-2.55	109	86	-0.060	10.52	0.24
62	7.982	0.130	1.77	93	-0.57	110	86	-0.080	10.80	0.24
63	8.112	0.130	1.76	93	-3.41	111	86	-0.070	10.28	0.25

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	8.246	0.134	1.76	93	-3.1	113	86	-0.070	9.69	0.32
65	8.375	0.129	1.75	93	-0.39	109	86	-0.070	9.44	0.25
66	8.507	0.132	1.75	94	-2.65	106	86	-0.060	9.55	0.27
67	8.641	0.134	1.78	94	-2.71	117	86	-0.060	9.49	0.22
68	8.769	0.128	1.76	94	-3.04	110	86	-0.070	9.42	0.23
69	8.902	0.133	1.76	94	-0.26	106	86	-0.060	9.33	0.23
70	9.034	0.132	1.76	94	-2.22	104	86	-0.070	9.40	0.22
71	9.162	0.128	1.70	94	-0.33	113	86	-0.070	9.31	0.22
72	9.294	0.132	1.71	95	-3.47	111	86	-0.060	9.18	0.23
73	9.425	0.131	1.71	95	-1	113	86	-0.070	9.08	0.23
74	9.552	0.127	1.71	95	-0.97	104	86	-0.070	9.03	0.23
75	9.684	0.132	1.72	95	-0.15	112	86	-0.070	9.17	0.24
76	9.815	0.131	1.71	95	-0.88	112	86	-0.070	8.93	0.27
77	9.942	0.127	1.71	95	-1.27	105	86	-0.070	8.84	0.24
78	10.073	0.131	1.71	96	-2.15	101	86	-0.060	8.80	0.21
79	10.205	0.132	1.72	96	-2.58	118	86	-0.060	8.73	0.21
80	10.332	0.127	1.71	96	-0.35	107	86	-0.060	8.40	0.25
81	10.462	0.130	1.70	96	-1.41	107	86	-0.060	8.18	0.24
82	10.594	0.132	1.70	96	-2.06	105	86	-0.070	8.00	0.26
83	10.722	0.128	1.71	96	-0.2	102	86	-0.060	7.98	0.23
84	10.852	0.130	1.71	96	-2.38	107	86	-0.070	7.94	0.25
85	10.984	0.132	1.72	97	-1.51	111	86	-0.060	7.95	0.26
86	11.111	0.127	1.71	97	-0.65	111	86	-0.060	7.98	0.25
87	11.241	0.130	1.71	97	-3.48	102	86	-0.050	8.08	0.26
88	11.374	0.133	1.70	97	-1.85	109	86	-0.070	8.10	0.27
89	11.501	0.127	1.71	97	-0.6	107	86	-0.060	8.15	0.27
90	11.632	0.131	1.71	97	-1.11	103	86	-0.070	8.16	0.28
91	11.766	0.134	1.73	97	-3.03	113	86	-0.060	8.26	0.30
92	11.894	0.128	1.73	97	-3.53	109	86	-0.080	8.37	0.28
93	12.026	0.132	1.74	98	-2.55	110	86	-0.060	8.41	0.27
94	12.159	0.133	1.72	98	-0.24	107	86	-0.070	8.66	0.28
95	12.287	0.128	1.73	98	-1.97	103	86	-0.060	8.83	0.30

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	12.418	0.131	1.71	98	-1.44	100	86	-0.060	9.11	0.30
97	12.551	0.133	1.74	98	-2.99	109	86	-0.060	8.99	0.30
98	12.678	0.127	1.73	98	-2.23	99	86	-0.060	8.86	0.33
99	12.810	0.132	1.71	98	-3.43	110	86	-0.050	8.72	0.31
100	12.942	0.132	1.72	98	-2.12	107	86	-0.070	8.55	0.33
101	13.070	0.128	1.73	98	-0.18	103	86	-0.050	8.59	0.34
102	13.201	0.131	1.72	98	-0.46	111	86	-0.060	8.67	0.32
103	13.333	0.132	1.72	98	-3.21	104	86	-0.060	8.70	0.31
104	13.461	0.128	1.71	98	-0.47	101	86	-0.070	8.66	0.31
105	13.592	0.131	1.71	98	-0.21	106	86	-0.060	8.79	0.28
106	13.724	0.132	1.71	98	-0.4	113	86	-0.070	8.78	0.29
107	13.851	0.127	1.71	99	-3.32	100	86	-0.070	8.88	0.29
108	13.983	0.132	1.70	99	-3.59	101	86	-0.060	8.88	0.27
109	14.115	0.132	1.71	99	-2.43	112	86	-0.060	8.84	0.29
110	14.242	0.127	1.69	99	-2.48	105	86	-0.060	8.90	0.33
111	14.373	0.131	1.71	99	-0.29	104	86	-0.070	8.81	0.31
112	14.504	0.131	1.70	99	-3.13	111	86	-0.070	8.80	0.30
113	14.632	0.128	1.71	99	-0.33	105	86	-0.060	8.73	0.27
114	14.762	0.130	1.72	99	-1.27	108	86	-0.060	8.77	0.28
115	14.894	0.132	1.70	99	-0.34	103	86	-0.060	8.57	0.25
116	15.021	0.127	1.69	99	-3.15	103	86	-0.070	8.50	0.28
117	15.151	0.130	1.70	99	-2.99	103	86	-0.070	8.63	0.30
118	15.284	0.133	1.71	99	-0.76	104	86	-0.060	8.44	0.26
119	15.411	0.127	1.70	99	-3.54	100	86	-0.070	8.47	0.27
120	15.540	0.129	1.70	99	-2.32	104	86	-0.060	8.35	0.25
121	15.673	0.133	1.69	99	-1.78	115	86	-0.060	8.40	0.26
122	15.801	0.128	1.70	99	-2.82	106	87	-0.060	8.21	0.15
123	15.930	0.129	1.70	99	-0.63	108	87	-0.060	8.14	0.12
124	16.062	0.132	1.70	99	-1.85	111	87	-0.060	8.16	0.15
125	16.191	0.129	1.70	99	-3.31	110	87	-0.060	8.10	0.12
126	16.319	0.128	1.69	99	-3.61	102	87	-0.060	8.00	0.14
127	16.452	0.133	1.69	99	-0.35	112	87	-0.060	8.02	0.15

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
128	16.581	0.129	1.71	99	-1.53	110	87	-0.070	7.96	0.14
129	16.709	0.128	1.70	100	-1.36	107	87	-0.060	8.01	0.18
130	16.841	0.132	1.71	100	-3.14	111	87	-0.070	7.98	0.18
131	16.970	0.129	1.70	100	-2.44	107	86	-0.060	7.94	0.18
132	17.098	0.128	1.70	100	-1.13	106	86	-0.050	8.05	0.14
133	17.229	0.131	1.69	100	-1.18	106	86	-0.060	8.09	0.17
134	17.359	0.130	1.69	100	-0.28	100	86	-0.050	8.06	0.17
135	17.487	0.128	1.70	100	-1.82	102	86	-0.060	7.96	0.17
136	17.619	0.132	1.69	100	-0.97	111	86	-0.060	8.15	0.15
137	17.748	0.129	1.70	100	-1.2	99	86	-0.060	8.13	0.16
138	17.877	0.129	1.70	100	-3.52	110	86	-0.060	8.18	0.15
139	18.008	0.131	1.69	100	-1.16	104	86	-0.050	8.26	0.16
140	18.137	0.129	1.69	100	-2.76	104	86	-0.060	8.22	0.14
141	18.267	0.130	1.71	100	-0.32	102	86	-0.060	8.27	0.13
142	18.397	0.130	1.70	100	-3.47	102	86	-0.060	8.06	0.13
143	18.526	0.129	1.71	100	-0.79	108	86	-0.060	7.79	0.21
144	18.655	0.129	1.70	100	-3.26	105	86	-0.060	7.52	0.23
145	18.786	0.131	1.69	100	-2.48	104	86	-0.060	7.28	0.26
146	18.914	0.128	1.68	101	-2.04	105	87	-0.050	6.99	0.32
147	19.043	0.129	1.69	101	-0.77	106	87	-0.060	6.92	0.37
148	19.174	0.131	1.67	101	-1.09	101	87	-0.060	6.86	0.36
149	19.303	0.129	1.68	101	-1.27	100	87	-0.050	6.92	0.40
150	19.430	0.127	1.67	101	-0.37	102	87	-0.070	6.90	0.38
151	19.561	0.131	1.66	101	-2.75	106	87	-0.060	6.91	0.33
152	19.690	0.129	1.66	101	-1.9	104	87	-0.040	6.83	0.37
153	19.816	0.126	1.66	101	-0.47	113	87	-0.060	6.99	0.35
154	19.947	0.131	1.66	101	-3.67	108	87	-0.060	7.00	0.32
155	20.077	0.130	1.66	101	-0.35	104	87	-0.050	6.97	0.33
156	20.202	0.125	1.64	101	-3.63	101	87	-0.060	7.02	0.32
157	20.330	0.128	1.66	101	-3.59	100	87	-0.070	7.09	0.32
158	20.462	0.132	1.66	101	-0.42	112	87	-0.060	7.19	0.31
159	20.589	0.127	1.66	101	-3.62	97	87	-0.050	7.14	0.34

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
160	20.715	0.126	1.65	101	-1.53	102	87	-0.050	6.96	0.32
161	20.845	0.130	1.65	101	-0.82	106	87	-0.050	6.96	0.31
162	20.973	0.128	1.63	101	-1.7	105	87	-0.040	7.17	0.32
163	21.100	0.127	1.64	101	-3.57	106	86	-0.060	7.10	0.30
164	21.229	0.129	1.65	101	-3.03	104	87	-0.050	7.15	0.28
165	21.356	0.127	1.64	102	-0.74	105	86	-0.060	7.09	0.28
166	21.483	0.127	1.64	102	-1.29	98	86	-0.050	7.12	0.26
167	21.612	0.129	1.63	102	-2.04	98	86	-0.060	7.25	0.27
168	21.740	0.128	1.63	102	-0.5	101	86	-0.050	7.41	0.23
169	21.866	0.126	1.63	102	-1.86	101	86	-0.050	7.50	0.23
170	21.992	0.126	1.63	102	-3.39	99	86	-0.060	7.51	0.23
171	22.122	0.130	1.62	102	-0.83	101	86	-0.040	7.59	0.25
172	22.248	0.126	1.61	102	-2.34	103	86	-0.060	7.41	0.24
173	22.374	0.126	1.62	102	-0.9	98	86	-0.060	6.92	0.25
174	22.503	0.129	1.62	102	-1.88	107	86	-0.050	6.35	0.36
175	22.629	0.126	1.62	102	-2.21	99	86	-0.050	6.23	0.38
176	22.755	0.126	1.60	102	-0.98	95	86	-0.040	6.24	0.39
177	22.882	0.127	1.60	102	-3.65	102	86	-0.050	6.12	0.39
178	23.010	0.128	1.61	102	-2.6	100	86	-0.050	6.18	0.42
179	23.134	0.124	1.60	102	-0.52	99	86	-0.040	6.19	0.40
180	23.260	0.126	1.58	102	-0.37	100	86	-0.050	6.11	0.44
181	23.387	0.127	1.57	102	-1.54	100	86	-0.050	6.04	0.43
182	23.512	0.125	1.59	102	-0.54	99	86	-0.050	6.29	0.43
183	23.637	0.125	1.58	102	-0.45	96	86	-0.050	6.18	0.40
184	23.764	0.127	1.57	102	-3.6	106	86	-0.060	6.28	0.39
185	23.890	0.126	1.57	102	-2.33	103	86	-0.050	6.47	0.41
186	24.013	0.123	1.60	102	-1.12	95	86	-0.050	6.16	0.44
187	24.138	0.125	1.58	102	-0.72	98	86	-0.040	5.06	0.68
188	24.264	0.126	1.56	102	-3.77	97	86	-0.060	4.92	0.80
189	24.389	0.125	1.57	102	-0.44	102	86	-0.040	4.89	0.80
190	24.513	0.124	1.58	103	-0.82	102	86	-0.050	4.83	0.78
191	24.640	0.127	1.57	103	-3.7	104	86	-0.050	4.81	0.81

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
192	24.766	0.126	1.57	103	-3.09	104	86	-0.050	4.84	0.74
193	24.891	0.125	1.58	103	-3.28	105	86	-0.050	4.97	0.66
194	25.015	0.124	1.58	103	-3.3	96	86	-0.050	4.88	0.67
195	25.142	0.127	1.57	103	-3.64	99	86	-0.040	4.89	0.67
196	25.267	0.125	1.58	103	-3.11	102	86	-0.050	4.97	0.66
197	25.392	0.125	1.59	103	-3.06	99	86	-0.050	4.85	0.63
198	25.519	0.127	1.59	103	-3.46	107	86	-0.050	4.93	0.63
199	25.645	0.126	1.59	103	-3.09	105	86	-0.040	4.88	0.77
200	25.770	0.125	1.57	103	-2.85	96	86	-0.050	4.82	0.67
201	25.894	0.124	1.57	103	-0.94	104	86	-0.040	4.82	0.70
202	26.022	0.128	1.58	103	-2.04	99	86	-0.040	4.79	0.65
203	26.147	0.125	1.58	103	-2.35	96	86	-0.040	4.70	0.85
204	26.272	0.125	1.59	103	-0.55	99	86	-0.050	4.78	0.67
205	26.399	0.127	1.58	103	-0.7	106	86	-0.040	4.67	0.77
206	26.526	0.127	1.59	103	-1.6	102	86	-0.040	4.90	0.70
207	26.650	0.124	1.58	103	-0.93	102	86	-0.030	4.79	0.71
208	26.775	0.125	1.59	103	-2.01	102	86	-0.030	4.77	0.66
209	26.903	0.128	1.59	103	-0.56	109	86	-0.040	4.76	0.76
210	27.028	0.125	1.59	103	-3.53	103	86	-0.040	4.82	0.67
211	27.153	0.125	1.58	103	-2.63	97	86	-0.040	4.66	0.85
212	27.280	0.127	1.59	103	-0.45	96	86	-0.050	4.67	0.84
213	27.408	0.128	1.61	103	-1.97	101	86	-0.040	4.85	0.69
214	27.531	0.123	1.59	103	-2.83	101	86	-0.030	4.65	0.83
215	27.657	0.126	1.60	103	-0.47	97	86	-0.040	4.73	0.84
216	27.784	0.127	1.59	103	-1.04	97	86	-0.040	4.66	0.85
217	27.910	0.126	1.59	103	-0.89	105	86	-0.040	4.74	0.86
218	28.035	0.125	1.60	103	-0.95	100	86	-0.050	4.65	0.82
219	28.162	0.127	1.58	103	-0.69	100	86	-0.030	4.76	0.85
220	28.289	0.127	1.59	103	-2.99	104	86	-0.050	4.78	0.85
221	28.412	0.123	1.59	103	-2.85	97	86	-0.030	4.75	0.82
222	28.538	0.126	1.59	103	-2.28	100	86	-0.040	4.74	0.83
223	28.666	0.128	1.58	103	-3.49	103	86	-0.030	4.88	0.83

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
224	28.792	0.126	1.59	103	-0.45	100	86	-0.030	4.87	0.82
225	28.916	0.124	1.60	103	-1.83	98	86	-0.030	4.85	0.79
226	29.045	0.129	1.59	103	-0.4	105	86	-0.030	4.92	0.83
227	29.170	0.125	1.60	103	-2.99	98	86	-0.040	4.81	0.83
228	29.294	0.124	1.59	103	-3.81	101	86	-0.040	4.79	0.79
229	29.419	0.125	1.60	103	-3.77	100	86	-0.040	4.83	0.80
230	29.548	0.129	1.59	103	-2.73	97	87	-0.040	4.79	0.80
231	29.673	0.125	1.60	103	-0.52	105	87	-0.030	4.81	0.78
232	29.798	0.125	1.59	103	-1.03	98	87	-0.040	4.81	0.78
233	29.926	0.128	1.58	103	-3.75	99	87	-0.020	4.84	0.77
234	30.051	0.125	1.59	103	-2.3	101	87	-0.020	4.82	0.75
235	30.175	0.124	1.59	103	-3.78	97	86	-0.030	4.79	0.74
236	30.301	0.126	1.58	103	-1.34	108	86	-0.030	4.90	0.75
237	30.429	0.128	1.59	103	-0.38	101	86	-0.040	4.83	0.73
238	30.554	0.125	1.58	102	-0.61	97	86	-0.030	4.77	0.72
239	30.679	0.125	1.58	102	-2.03	106	86	-0.040	4.83	0.75
240	30.806	0.127	1.58	102	-2.53	99	86	-0.030	4.80	0.75
241	30.931	0.125	1.56	102	-3.42	98	86	-0.040	4.79	0.72
242	31.055	0.124	1.59	102	-1.99	103	86	-0.050	4.86	0.71
243	31.181	0.126	1.57	102	-0.61	96	86	-0.040	4.82	0.69
244	31.309	0.128	1.58	102	-0.58	101	86	-0.030	4.90	0.70
245	31.434	0.125	1.59	102	-3.17	103	86	-0.030	4.82	0.69
246	31.558	0.124	1.56	102	-3.78	95	86	-0.040	4.84	0.67
247	31.685	0.127	1.58	102	-0.45	105	86	-0.040	4.72	0.69
248	31.810	0.125	1.60	102	-3.66	98	86	-0.040	4.81	0.71
249	31.934	0.124	1.59	102	-2.92	97	86	-0.040	4.83	0.67
250	32.059	0.125	1.57	102	-0.51	106	86	-0.030	4.89	0.70
251	32.188	0.129	1.58	102	-2.13	100	86	-0.030	4.74	0.67
252	32.312	0.124	1.58	102	-0.41	103	87	-0.040	4.79	0.69
253	32.437	0.125	1.57	102	-1.12	95	87	-0.030	4.86	0.70
254	32.564	0.127	1.59	102	-0.49	102	87	-0.030	4.83	0.67
255	32.689	0.125	1.57	102	-3.72	97	87	-0.040	4.73	0.68

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
256	32.813	0.124	1.57	102	-3.54	100	87	-0.040	4.71	0.68
257	32.938	0.125	1.58	102	-2.86	95	87	-0.040	4.80	0.68
258	33.065	0.127	1.56	102	-3.1	100	86	-0.040	4.72	0.69
259	33.190	0.125	1.57	102	-0.47	100	86	-0.030	4.86	0.69
260	33.314	0.124	1.57	102	-0.62	97	86	-0.040	4.83	0.69
261	33.440	0.126	1.57	102	-3.07	106	86	-0.040	4.86	0.69
262	33.567	0.127	1.57	102	-3.45	98	86	-0.040	4.80	0.68
263	33.689	0.122	1.58	102	-2.11	97	86	-0.040	4.80	0.68
264	33.814	0.125	1.58	102	-0.43	103	86	-0.030	4.75	0.66
265	33.941	0.127	1.57	102	-3.76	98	86	-0.040	4.82	0.68
266	34.065	0.124	1.56	102	-2.61	93	86	-0.030	4.83	0.64
267	34.190	0.125	1.57	102	-3.47	101	86	-0.030	4.89	0.67
268	34.316	0.126	1.58	102	-0.51	102	86	-0.040	4.87	0.68
269	34.442	0.126	1.56	102	-3.07	99	86	-0.040	4.74	0.66
270	34.566	0.124	1.58	102	-2.78	97	86	-0.040	4.88	0.69
271	34.690	0.124	1.57	102	-0.54	102	86	-0.040	4.78	0.63
272	34.816	0.126	1.58	102	-2.09	98	86	-0.050	4.98	0.66
273	34.941	0.125	1.57	102	-3.27	99	86	-0.040	4.81	0.66
274	35.064	0.123	1.56	102	-0.48	97	86	-0.030	4.96	0.66
275	35.188	0.124	1.56	102	-0.56	96	86	-0.020	5.01	0.66
276	35.316	0.128	1.56	102	-3.71	99	86	-0.040	5.03	0.64
277	35.440	0.124	1.55	102	-1.08	97	86	-0.040	5.03	0.63
278	35.563	0.123	1.55	102	-0.87	93	87	-0.040	4.94	0.65
279	35.689	0.126	1.56	102	-0.45	98	87	-0.040	4.98	0.65
280	35.814	0.125	1.56	102	-3.17	94	87	-0.040	4.97	0.63
281	35.937	0.123	1.55	102	-2.13	93	87	-0.030	4.99	0.66
282	36.060	0.123	1.56	102	-3.17	93	87	-0.040	5.05	0.64
283	36.186	0.126	1.55	102	-3.74	95	87	-0.040	5.01	0.64
284	36.310	0.124	1.53	102	-2.35	97	87	-0.040	4.88	0.62
285	36.432	0.122	1.55	102	-1.94	96	87	-0.040	5.03	0.64
286	36.556	0.124	1.54	102	-2.88	96	87	-0.040	5.17	0.66
287	36.682	0.126	1.54	102	-3.41	101	87	-0.040	5.03	0.62

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
288	36.806	0.124	1.54	102	-3.73	100	87	-0.020	4.99	0.61
289	36.928	0.122	1.53	102	-2.76	93	87	-0.040	5.09	0.61
290	37.053	0.125	1.53	102	-3.38	94	87	-0.050	5.04	0.63
291	37.178	0.125	1.52	102	-0.54	99	87	-0.030	5.03	0.66
292	37.300	0.122	1.52	102	-0.47	95	87	-0.030	4.97	0.63
293	37.422	0.122	1.52	102	-0.86	98	87	-0.040	4.98	0.59
294	37.547	0.125	1.52	102	-0.7	99	87	-0.040	4.98	0.60
295	37.671	0.124	1.53	102	-0.7	94	87	-0.030	5.08	0.60
296	37.793	0.122	1.52	102	-3.83	94	87	-0.040	5.10	0.62
297	37.915	0.122	1.53	102	-0.59	101	86	-0.040	5.02	0.62
298	38.039	0.124	1.50	102	-3.94	95	86	-0.040	4.88	0.59
299	38.162	0.123	1.52	102	-0.57	98	86	-0.040	5.04	0.61
300	38.283	0.121	1.51	102	-0.85	99	86	-0.030	5.06	0.59
301	38.405	0.122	1.51	102	-3.68	93	86	-0.030	5.00	0.61
302	38.529	0.124	1.51	102	-3.81	95	86	-0.040	4.98	0.62
303	38.651	0.122	1.51	102	-0.55	92	86	-0.020	5.02	0.60
304	38.772	0.121	1.48	102	-1.79	90	86	-0.040	5.11	0.62
305	38.894	0.122	1.51	102	-2.72	98	86	-0.040	4.97	0.61
306	39.017	0.123	1.51	102	-0.62	101	86	-0.040	5.01	0.59
307	39.139	0.122	1.49	102	-2.23	99	86	-0.040	5.08	0.61
308	39.260	0.121	1.49	102	-1.71	98	86	-0.030	5.07	0.59
309	39.381	0.121	1.48	101	-0.69	92	86	-0.030	4.94	0.63
310	39.504	0.123	1.47	102	-0.83	102	86	-0.040	5.01	0.62
311	39.626	0.122	1.48	101	-0.9	97	86	-0.030	5.04	0.61
312	39.746	0.120	1.45	102	-2.24	94	86	-0.030	5.03	0.59
313	39.866	0.120	1.47	101	-3.87	101	87	-0.040	5.04	0.60
314	39.988	0.122	1.47	101	-1.03	98	87	-0.030	5.06	0.58
315	40.109	0.121	1.48	101	-1.24	98	87	-0.040	4.99	0.56
316	40.231	0.122	1.47	101	-0.96	100	87	-0.020	5.13	0.55
317	40.353	0.122	1.45	101	-3.85	96	87	-0.030	5.15	0.56
318	40.476	0.123	1.47	101	-3.95	97	87	-0.040	5.01	0.56
319	40.600	0.124	1.45	101	-1.65	101	87	-0.030	5.11	0.57

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
320	40.721	0.121	1.45	101	-3.07	99	86	-0.040	5.02	0.56
321	40.842	0.121	1.45	101	-3.14	95	86	-0.030	4.98	0.54
322	40.966	0.124	1.44	101	-1.11	103	86	-0.030	4.98	0.53
323	41.089	0.123	1.44	101	-1.33	94	86	-0.040	5.05	0.58
324	41.211	0.122	1.44	101	-3.92	101	86	-0.030	5.03	0.54
325	41.332	0.121	1.42	101	-3.93	99	86	-0.040	5.01	0.55
326	41.455	0.123	1.44	101	-0.87	93	86	-0.040	5.05	0.53
327	41.578	0.123	1.44	101	-2.68	104	86	-0.040	5.05	0.53
328	41.699	0.121	1.44	101	-0.93	92	86	-0.040	5.05	0.57
329	41.820	0.121	1.42	101	-1.41	95	86	-0.030	4.93	0.56
330	41.943	0.123	1.41	101	-1.17	102	86	-0.040	5.04	0.53
331	42.066	0.123	1.42	101	-3.07	96	86	-0.020	5.13	0.55
332	42.187	0.121	1.41	101	-2.76	93	86	-0.040	5.06	0.52
333	42.308	0.121	1.41	101	-3.15	101	86	-0.050	5.16	0.54
334	42.431	0.123	1.39	101	-3.18	99	87	-0.030	5.17	0.56
335	42.553	0.122	1.40	101	-3.83	96	87	-0.030	5.16	0.55
336	42.674	0.121	1.40	101	-3.76	91	86	-0.040	5.19	0.53
337	42.795	0.121	1.40	101	-3.86	91	86	-0.040	5.01	0.53
338	42.917	0.122	1.39	101	-3.67	99	86	-0.040	5.14	0.55
339	43.040	0.123	1.39	101	-3.8	94	86	-0.030	5.08	0.52
340	43.161	0.121	1.40	101	-3.01	96	86	-0.040	5.02	0.56
341	43.280	0.119	1.38	101	-1.48	100	86	-0.030	5.15	0.55
342	43.402	0.122	1.37	101	-1.82	100	86	-0.040	5.11	0.55
343	43.525	0.123	1.37	101	-1.21	102	86	-0.040	5.15	0.52
344	43.646	0.121	1.38	101	-3.39	100	86	-0.040	5.19	0.53
345	43.766	0.120	1.37	101	-4	96	86	-0.050	5.24	0.51
346	43.888	0.122	1.36	101	-3.27	97	86	-0.030	5.30	0.52
347	44.011	0.123	1.36	101	-1.21	99	87	-0.050	5.21	0.54
348	44.132	0.121	1.36	101	-0.97	97	87	-0.040	5.18	0.51
349	44.252	0.120	1.34	101	-0.89	94	87	-0.030	5.20	0.50
350	44.373	0.121	1.34	101	-0.89	101	87	-0.040	5.18	0.50
351	44.496	0.123	1.34	101	-1.18	97	87	-0.030	5.18	0.48

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
352	44.618	0.122	1.32	101	-0.85	95	87	-0.040	5.18	0.57
353	44.738	0.120	1.33	101	-3.96	98	87	-0.040	5.21	0.54
354	44.859	0.121	1.30	101	-1.52	96	87	-0.030	5.14	0.55
355	44.982	0.123	1.30	101	-1.45	100	87	-0.040	5.14	0.52
356	45.104	0.122	1.29	101	-1.66	91	87	-0.040	5.24	0.54
357	45.224	0.120	1.29	101	-1.49	97	87	-0.040	5.19	0.53
358	45.344	0.120	1.30	101	-0.94	96	87	-0.030	5.26	0.52
359	45.467	0.123	1.28	101	-1	95	87	-0.030	5.27	0.54
360	45.588	0.121	1.26	101	-1.3	98	87	-0.050	5.20	0.52
361	45.708	0.120	1.27	101	-4.18	93	87	-0.040	5.23	0.51
362	45.828	0.120	1.25	101	-1.36	95	87	-0.040	5.36	0.50
363	45.951	0.123	1.24	101	-4	96	87	-0.040	5.25	0.51
364	46.073	0.122	1.24	101	-4.22	95	87	-0.030	5.30	0.52
365	46.193	0.120	1.22	101	-4.2	99	87	-0.040	5.17	0.52
366	46.313	0.120	1.22	101	-3.43	92	86	-0.030	5.18	0.48
367	46.434	0.121	1.20	101	-3.48	99	86	-0.030	5.20	0.49
368	46.556	0.122	1.21	101	-1.15	102	86	-0.040	5.28	0.49
369	46.676	0.120	1.19	101	-4.06	99	86	-0.030	5.21	0.47
370	46.796	0.120	1.20	101	-4.11	91	86	-0.040	5.39	0.49
371	46.917	0.121	1.18	101	-4.29	98	86	-0.040	5.25	0.50
372	47.040	0.123	1.18	101	-1.11	100	86	-0.040	5.33	0.46
373	47.161	0.121	1.18	101	-1.7	95	86	-0.030	5.20	0.45
374	47.280	0.119	1.17	101	-1.13	89	86	-0.030	5.20	0.46
375	47.401	0.121	1.16	101	-1.19	95	86	-0.040	5.26	0.46
376	47.524	0.123	1.15	101	-1.73	101	86	-0.040	5.32	0.47
377	47.645	0.121	1.15	101	-2.91	98	86	-0.040	5.22	0.46
378	47.765	0.120	1.15	101	-2.9	92	86	-0.040	5.20	0.46
379	47.884	0.119	1.13	101	-1.53	89	86	-0.030	5.13	0.47
380	48.006	0.122	1.12	101	-1.43	98	86	-0.030	5.10	0.51
381	48.127	0.121	1.12	101	-4.38	95	87	-0.030	5.05	0.53
382	48.247	0.120	1.10	101	-2.6	92	87	-0.040	5.05	0.52
383	48.366	0.119	1.08	101	-2.29	92	87	-0.040	5.26	0.46

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
384	48.488	0.122	1.08	101	-3.16	95	87	-0.030	5.26	0.44
385	48.609	0.121	1.08	101	-1.51	99	87	-0.040	5.26	0.46
386	48.729	0.120	1.09	101	-1.27	103	87	-0.040	5.30	0.44
387	48.848	0.119	1.07	101	-4.53	98	87	-0.040	5.20	0.43
388	48.969	0.121	1.06	101	-1.62	92	87	-0.030	5.27	0.46
389	49.091	0.122	1.06	101	-4.47	93	87	-0.030	5.32	0.45
390	49.212	0.121	1.06	101	-1.47	99	87	-0.050	5.20	0.42
391	49.331	0.119	1.05	101	-1.54	95	87	-0.040	5.17	0.45
392	49.451	0.120	1.05	101	-2.34	97	87	-0.040	5.25	0.42
393	49.574	0.123	1.04	101	-4.51	93	87	-0.050	5.18	0.44
394	49.694	0.120	1.04	101	-4.57	91	87	-0.040	5.10	0.49
395	49.814	0.120	1.02	101	-1.36	97	87	-0.030	5.15	0.49
396	49.933	0.119	1.03	101	-4.55	98	87	-0.040	5.02	0.49
397	50.054	0.121	1.02	101	-4.57	100	87	-0.030	5.21	0.47
398	50.176	0.122	1.02	101	-3.2	102	87	-0.040	5.14	0.48
399	50.295	0.119	1.01	101	-1.56	97	87	-0.040	5.03	0.49
400	50.414	0.119	1.00	101	-4.05	99	87	-0.030	4.97	0.49
401	50.535	0.121	1.00	101	-3.42	99	87	-0.030	5.15	0.47
402	50.657	0.122	0.99	101	-4.63	100	87	-0.030	4.99	0.52
403	50.778	0.121	0.99	101	-4.36	96	86	-0.040	4.99	0.52
404	50.896	0.118	1.00	101	-1.54	89	86	-0.030	5.06	0.48
405	51.017	0.121	1.00	101	-1.54	95	86	-0.030	4.97	0.50
406	51.139	0.122	0.99	101	-1.54	95	86	-0.030	4.98	0.51
407	51.261	0.122	0.99	101	-1.6	97	86	-0.030	4.98	0.48
408	51.379	0.118	0.98	101	-1.46	94	86	-0.040	4.97	0.51
409	51.499	0.120	0.97	101	-1.61	93	86	-0.040	4.95	0.48
410	51.620	0.121	1.00	101	-1.49	96	86	-0.040	5.08	0.49
411	51.742	0.122	0.97	101	-2.83	94	86	-0.040	5.01	0.49
412	51.861	0.119	0.97	101	-1.72	100	86	-0.040	4.98	0.49
413	51.980	0.119	0.97	101	-2.73	94	86	-0.040	4.91	0.50
414	52.101	0.121	0.97	101	-1.86	101	86	-0.040	4.95	0.49
415	52.223	0.122	0.97	101	-1.93	104	86	-0.030	4.86	0.49

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
416	52.343	0.120	0.96	101	-1.94	93	86	-0.040	4.93	0.48
417	52.462	0.119	0.96	101	-4.57	101	86	-0.030	4.81	0.51
418	52.582	0.120	0.96	101	-1.79	97	86	-0.040	4.92	0.48
419	52.705	0.123	0.95	101	-2.41	95	86	-0.040	4.85	0.49
420	52.826	0.121	0.96	101	-3.67	95	86	-0.040	4.86	0.48
421	52.945	0.119	0.94	101	-2.71	96	86	-0.040	4.73	0.52
422	53.064	0.119	0.94	101	-4.28	98	86	-0.040	4.77	0.51
423	53.186	0.122	0.95	101	-1.67	103	86	-0.040	4.82	0.50
424	53.308	0.122	0.94	101	-4.1	102	86	-0.040	4.79	0.53
425	53.427	0.119	0.95	101	-1.78	98	86	-0.040	4.76	0.53
426	53.546	0.119	0.93	101	-4.31	93	86	-0.030	4.84	0.52
427	53.666	0.120	0.93	101	-2.7	99	87	-0.030	4.79	0.52
428	53.788	0.122	0.93	101	-2.56	99	87	-0.040	4.70	0.55
429	53.908	0.120	0.93	101	-1.69	98	87	-0.040	4.75	0.54
430	54.027	0.119	0.92	101	-2.08	95	87	-0.040	4.72	0.51
431	54.148	0.121	0.92	101	-2.73	98	87	-0.040	4.67	0.50
432	54.270	0.122	0.92	101	-4.23	96	87	-0.040	4.74	0.49
433	54.391	0.121	0.92	101	-1.61	90	87	-0.040	4.70	0.49
434	54.510	0.119	0.91	101	-2.62	95	87	-0.030	4.80	0.53
435	54.630	0.120	0.91	101	-1.63	99	87	-0.030	4.85	0.53
436	54.752	0.122	0.91	101	-4.55	99	87	-0.040	4.86	0.52
437	54.873	0.121	0.91	101	-1.64	95	87	-0.030	4.74	0.51
438	54.992	0.119	0.90	101	-2.07	95	87	-0.040	4.72	0.50
439	55.111	0.119	0.90	101	-1.78	96	87	-0.040	4.69	0.48
440	55.232	0.121	0.89	101	-1.78	96	87	-0.040	4.67	0.49
441	55.354	0.122	0.90	101	-4.77	100	87	-0.040	4.66	0.48
442	55.473	0.119	0.89	101	-3.23	91	87	-0.020	4.65	0.49
443	55.593	0.120	0.89	101	-3.88	97	87	-0.040	4.67	0.47
444	55.713	0.120	0.91	101	-1.79	99	87	-0.030	4.62	0.47
445	55.835	0.122	0.89	101	-4.75	94	87	-0.040	4.56	0.46
446	55.956	0.121	0.89	101	-1.61	99	87	-0.030	4.52	0.46
447	56.075	0.119	0.90	101	-4.48	91	86	-0.030	4.53	0.46

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
448	56.195	0.120	0.88	101	-1.72	94	86	-0.030	4.56	0.47
449	56.318	0.123	0.90	101	-1.68	91	86	-0.040	4.47	0.45
450	56.438	0.120	0.89	101	-1.66	95	86	-0.040	4.64	0.44
451	56.558	0.120	0.89	101	-1.63	91	86	-0.040	4.51	0.44
452	56.677	0.119	0.90	101	-4.22	96	86	-0.040	4.47	0.45
453	56.798	0.121	0.88	101	-3.26	94	86	-0.040	4.50	0.45
454	56.920	0.122	0.88	101	-4.91	100	86	-0.040	4.50	0.45
455	57.039	0.119	0.88	101	-4.48	98	86	-0.040	4.52	0.43
456	57.158	0.119	0.88	101	-4.31	99	86	-0.030	4.47	0.46
457	57.278	0.120	0.89	101	-2.32	97	86	-0.030	4.50	0.45
458	57.401	0.123	0.90	101	-4.7	97	86	-0.040	4.58	0.46
459	57.520	0.119	0.89	101	-4.2	91	86	-0.040	4.53	0.47
460	57.639	0.119	0.87	101	-3.66	101	86	-0.040	4.46	0.47
461	57.760	0.121	0.88	101	-4.67	93	86	-0.030	4.44	0.46
462	57.882	0.122	0.86	101	-4.49	92	86	-0.040	4.44	0.45
463	58.002	0.120	0.86	100	-3.38	95	87	-0.040	4.39	0.45
464	58.121	0.119	0.88	101	-1.72	95	87	-0.030	4.41	0.46
465	58.239	0.118	0.88	100	-3.11	90	87	-0.030	4.37	0.44
466	58.360	0.121	0.86	100	-4.75	95	87	-0.040	4.38	0.47
467	58.480	0.120	0.87	100	-1.83	100	87	-0.040	4.34	0.46
468	58.600	0.120	0.86	100	-3.63	92	86	-0.040	4.31	0.46
469	58.718	0.118	0.86	100	-4.94	97	86	-0.040	4.34	0.49
470	58.837	0.119	0.84	100	-2.51	92	86	-0.040	4.31	0.46
471	58.959	0.122	0.86	100	-3.01	100	86	-0.030	4.30	0.47
472	59.079	0.120	0.85	100	-3.3	99	86	-0.040	4.30	0.51
473	59.196	0.117	0.85	100	-2.05	88	86	-0.030	4.25	0.48
474	59.314	0.118	0.85	100	-4.32	94	86	-0.040	4.17	0.46
475	59.433	0.119	0.86	100	-1.7	93	86	-0.030	4.31	0.48
476	59.554	0.121	0.84	100	-2.99	99	86	-0.040	4.10	0.48
477	59.673	0.119	0.85	100	-4.88	98	86	-0.040	4.19	0.46
478	59.790	0.117	0.85	100	-4.94	95	86	-0.040	4.20	0.46
479	59.909	0.119	0.84	100	-2.11	98	86	-0.040	4.16	0.48

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
480	60.029	0.120	0.84	100	-4.74	93	86	-0.030	4.17	0.46
481	60.149	0.120	0.85	100	-4.4	90	86	-0.040	4.19	0.49
482	60.267	0.118	0.84	100	-2.88	93	86	-0.040	4.17	0.46
483	60.383	0.116	0.84	100	-4.15	97	86	-0.040	4.11	0.46
484	60.503	0.120	0.83	100	-2.32	92	87	-0.030	4.23	0.46
485	60.623	0.120	0.84	100	-2.25	93	87	-0.030	4.21	0.47
486	60.743	0.120	0.82	100	-2.27	93	87	-0.030	4.17	0.48
487	60.860	0.117	0.82	100	-4.95	96	87	-0.030	4.16	0.49
488	60.978	0.118	0.84	100	-1.86	91	87	-0.030	4.10	0.49
489	61.097	0.119	0.83	100	-1.82	91	87	-0.030	4.13	0.50
490	61.216	0.119	0.83	100	-4.94	95	87	-0.030	4.18	0.46
491	61.335	0.119	0.83	100	-1.86	95	87	-0.030	4.15	0.45
492	61.452	0.117	0.83	100	-2.36	93	87	-0.030	4.12	0.50
493	61.571	0.119	0.82	100	-1.87	93	87	-0.030	4.02	0.47
494	61.691	0.120	0.82	100	-4.65	100	87	-0.030	4.12	0.48
495	61.810	0.119	0.82	100	-4.41	100	87	-0.040	4.05	0.49
496	61.927	0.117	0.82	100	-2.36	89	86	-0.040	4.10	0.48
497	62.044	0.117	0.80	100	-1.92	93	86	-0.030	4.20	0.49
498	62.163	0.119	0.82	100	-1.79	99	86	-0.030	4.05	0.47
499	62.283	0.120	0.81	100	-3.77	101	86	-0.040	3.99	0.47
500	62.402	0.119	0.80	100	-2	97	86	-0.030	4.10	0.48
501	62.519	0.117	0.83	100	-4.99	94	86	-0.040	4.10	0.48
502	62.636	0.117	0.81	100	-4.99	89	86	-0.030	4.00	0.47
503	62.754	0.118	0.80	100	-4.94	98	86	-0.030	3.96	0.48
504	62.874	0.120	0.80	100	-2.44	98	86	-0.040	4.02	0.47
505	62.992	0.118	0.80	100	-3.09	91	86	-0.040	3.97	0.49
506	63.110	0.118	0.79	100	-4.94	95	86	-0.030	3.93	0.51
507	63.227	0.117	0.78	100	-2.46	95	86	-0.050	4.06	0.54
508	63.345	0.118	0.79	100	-2.15	96	86	-0.030	4.05	0.51
509	63.464	0.119	0.79	100	-4.61	93	87	-0.030	4.21	0.48
510	63.582	0.118	0.79	100	-1.98	94	87	-0.040	3.87	0.45
511	63.699	0.117	0.77	100	-4.58	94	87	-0.040	3.76	0.46

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
512	63.816	0.117	0.78	100	-2.05	90	87	-0.040	3.75	0.43
513	63.935	0.119	0.77	100	-2.67	92	87	-0.040	3.76	0.40
514	64.054	0.119	0.77	100	-1.98	95	87	-0.030	3.74	0.42
515	64.171	0.117	0.78	100	-2.45	95	87	-0.040	3.73	0.41
516	64.287	0.116	0.78	100	-5	96	87	-0.030	3.77	0.41
517	64.406	0.119	0.77	100	-5.04	95	87	-0.040	3.68	0.42
518	64.524	0.118	0.77	100	-4.73	100	87	-0.040	3.69	0.40
519	64.643	0.119	0.77	100	-5.07	92	87	-0.030	3.79	0.41
520	64.759	0.116	0.77	100	-2.18	93	87	-0.020	3.65	0.41
521	64.876	0.117	0.76	100	-2.2	93	87	-0.040	3.68	0.42
522	64.994	0.118	0.77	100	-4.58	99	87	-0.040	3.73	0.43
523	65.112	0.118	0.77	100	-1.88	94	87	-0.040	3.72	0.41
524	65.231	0.119	0.78	100	-2.62	96	87	-0.040	3.72	0.44
525	65.347	0.116	0.77	100	-5	98	87	-0.030	3.57	0.39
526	65.464	0.117	0.77	100	-3.3	87	87	-0.030	3.54	0.38
527	65.581	0.117	0.77	100	-2.6	90	87	-0.030	3.69	0.39
528	65.701	0.120	0.76	100	-2.28	100	87	-0.030	3.68	0.37
529	65.819	0.118	0.76	100	-2.28	93	87	-0.040	3.51	0.39
530	65.935	0.116	0.76	100	-5.02	89	87	-0.030	3.72	0.37
531	66.051	0.116	0.76	100	-4.72	91	86	-0.030	3.59	0.39
532	66.168	0.117	0.75	100	-2.7	91	86	-0.030	3.65	0.37
533	66.289	0.121	0.76	100	-3.14	94	86	-0.040	3.61	0.37
534	66.406	0.117	0.76	100	-4.19	95	86	-0.030	3.48	0.38
535	66.523	0.117	0.76	100	-2.54	96	86	-0.030	3.58	0.38
536	66.638	0.115	0.75	100	-4.96	89	86	-0.030	3.53	0.40
537	66.756	0.118	0.76	100	-2.01	90	86	-0.020	3.61	0.38
538	66.876	0.120	0.76	100	-2.2	93	86	-0.030	3.56	0.39
539	66.994	0.118	0.76	100	-2.04	93	86	-0.030	3.69	0.37
540	67.110	0.116	0.76	100	-2.3	95	86	-0.030	3.54	0.37
541	67.226	0.116	0.74	100	-2.28	93	86	-0.030	3.56	0.37
542	67.344	0.118	0.77	100	-4.39	94	86	-0.040	3.54	0.38
543	67.463	0.119	0.75	100	-2.44	90	86	-0.020	3.60	0.37

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
544	67.581	0.118	0.75	100	-5.07	92	87	-0.030	3.51	0.38
Avg/Tot	67.581	0.124	1.37	99	-2.28	100	86	-0.046	6.02	0.48

LAB SAMPLE DATA - ASTM E2515

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T473	94.0	94.0	100.3	6.3
Train A Filters - Remainder	T474	93.8	187.3	190.1	2.8
	T475	93.5			
Train A Probe	4A	116183.1	116183.1	116183.9	0.8
Train A O-Rings	4A	3623.8	3623.8	3623.3	0.0*
Train B Filters	T476	94.1	188.2	194.9	6.7
	T477	94.1			
Train B Probe	4B	116366.6	116366.6	116367.9	1.3
Train B O-Rings	4B	3580.4	3580.4	3582.5	2.1
Background Filter			0.0	0.0	

**Negative value corrected to zero*

Placed in Dessicator on:	
---------------------------------	--

Train A Filters - First Hour	100.5	5/18 8:35	100.3	5/20 14:28		
Train A Filters - Remainder	190.2	5/19 8:41	190.1	5/20 14:29		
Train A Probe	116184.0	5/19 8:55	116183.9	5/20 14:27		
Train A O-Rings	3624.4	5/19 8:40	3623.4	5/20 14:27	3623.3	5/21 12:23
Train B Filters	195.4	5/19 8:40	195.0	5/20 14:29	194.9	5/21 12:24
Train B Probe	116368.0	5/19 8:55	116367.9	5/20 14:27		
Train B O-Rings	3583.7	5/19 8:40	3582.6	5/20 14:28	3582.5	5/21 12:23
Background Filter						

1st hour Sub-Total, mg:	6.3
Remainder Sub-Total, mg:	3.6
Train 1 Aggregate, mg:	9.9
Train 2 Aggregate, mg:	10.1
Ambient Aggregate, mg:	0.0

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
0	444	530	498	305	252	405.8	N/A	
1	442	523	470	296	252	396.6	N/A	
2	439	519	481	290	252	396.2	N/A	
3	435	515	481	286	251	393.6	N/A	
4	429	509	452	283	250	384.6	N/A	
5	424	502	438	283	248	379.0	N/A	
6	419	496	429	285	247	375.2	N/A	
7	414	490	421	291	246	372.4	N/A	
8	410	485	417	301	244	371.4	N/A	
9	405	478	414	206	242	349.0	N/A	
10	401	474	409	236	241	352.2	N/A	
11	399	471	403	217	239	345.8	N/A	
12	396	469	400	219	238	344.4	N/A	
13	395	466	395	240	238	346.8	N/A	
14	394	465	393	233	238	344.6	N/A	
15	392	462	395	236	237	344.4	N/A	
16	389	459	399	233	237	343.4	N/A	
17	387	457	401	233	236	342.8	N/A	
18	384	454	400	232	236	341.2	N/A	
19	381	452	396	233	235	339.4	N/A	
20	378	450	394	232	234	337.6	N/A	
21	375	447	389	234	233	335.6	N/A	
22	371	445	386	233	232	333.4	N/A	
23	368	443	382	233	231	331.4	N/A	
24	366	440	379	232	229	329.2	N/A	
25	363	438	374	232	228	327.0	N/A	
26	360	437	372	233	227	325.8	N/A	
27	358	434	370	232	226	324.0	N/A	
28	356	432	367	231	225	322.2	N/A	
29	354	430	366	232	223	321.0	N/A	
30	352	429	364	234	222	320.2	N/A	
31	351	428	362	233	221	319.0	N/A	
32	349	427	361	234	220	318.2	N/A	
33	348	425	359	234	218	316.8	N/A	
34	347	425	357	235	217	316.2	N/A	
35	347	424	355	235	216	315.4	N/A	
36	346	423	353	235	215	314.4	N/A	
37	345	423	351	236	214	313.8	N/A	
38	345	423	348	236	213	313.0	N/A	
39	345	422	346	235	212	312.0	N/A	
40	344	422	344	235	210	311.0	N/A	
41	344	423	342	234	209	310.4	N/A	
42	343	423	341	234	208	309.8	N/A	
43	342	424	339	233	207	309.0	N/A	
44	342	425	337	232	206	308.4	N/A	
45	341	426	336	231	205	307.8	N/A	
46	340	426	335	230	204	307.0	N/A	
47	340	427	334	230	203	306.8	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
48	339	428	332	231	202	306.4	N/A	
49	339	428	332	235	201	307.0	N/A	
50	338	428	331	249	200	309.2	N/A	
51	337	429	330	237	199	306.4	N/A	
52	337	429	329	227	198	304.0	N/A	
53	335	429	328	222	197	302.2	N/A	
54	335	429	326	221	196	301.4	N/A	
55	334	429	325	221	195	300.8	N/A	
56	333	429	325	220	194	300.2	N/A	
57	333	429	324	220	193	299.8	N/A	
58	333	428	323	220	193	299.4	N/A	
59	333	429	323	219	192	299.2	N/A	
60	332	429	322	219	191	298.6	N/A	
61	333	430	322	222	190	299.4	N/A	
62	333	430	322	223	189	299.4	N/A	
63	334	430	321	222	189	299.2	N/A	
64	335	431	321	221	188	299.2	N/A	
65	336	432	321	220	187	299.2	N/A	
66	337	433	321	219	186	299.2	N/A	
67	338	433	322	218	186	299.4	N/A	
68	338	434	322	217	185	299.2	N/A	
69	340	434	322	217	184	299.4	N/A	
70	340	434	322	217	183	299.2	N/A	
71	341	433	322	215	182	298.6	N/A	
72	341	433	322	215	182	298.6	N/A	
73	342	433	326	213	181	299.0	N/A	
74	343	432	326	213	181	299.0	N/A	
75	343	431	326	212	180	298.4	N/A	
76	343	431	326	211	180	298.2	N/A	
77	344	431	326	211	179	298.2	N/A	
78	345	430	328	211	179	298.6	N/A	
79	345	430	329	213	178	299.0	N/A	
80	346	430	329	216	177	299.6	N/A	
81	346	430	329	220	177	300.4	N/A	
82	346	428	329	223	176	300.4	N/A	
83	345	427	328	249	176	305.0	N/A	
84	344	427	328	335	175	321.8	N/A	
85	343	426	328	319	175	318.2	N/A	
86	342	425	327	310	174	315.6	N/A	
87	340	425	326	313	174	315.6	N/A	
88	339	423	324	312	173	314.2	N/A	
89	338	423	325	317	173	315.2	N/A	
90	337	423	323	312	172	313.4	N/A	
91	336	422	322	252	172	300.8	N/A	
92	336	421	322	230	171	296.0	N/A	
93	335	421	321	209	171	291.4	N/A	
94	334	421	321	203	170	289.8	N/A	
95	334	421	320	202	170	289.4	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	333	421	319	209	169	290.2	N/A
97	333	420	319	212	169	290.6	N/A
98	334	421	319	218	169	292.2	N/A
99	333	421	319	220	168	292.2	N/A
100	333	421	319	224	168	293.0	N/A
101	333	421	318	222	167	292.2	N/A
102	333	421	318	222	167	292.2	N/A
103	333	421	318	219	166	291.4	N/A
104	333	421	318	209	166	289.4	N/A
105	334	422	317	206	166	289.0	N/A
106	333	421	318	205	165	288.4	N/A
107	333	422	318	203	165	288.2	N/A
108	334	422	317	203	165	288.2	N/A
109	334	422	317	203	164	288.0	N/A
110	334	423	317	207	164	289.0	N/A
111	334	423	317	207	163	288.8	N/A
112	335	422	317	213	163	290.0	N/A
113	335	423	317	229	163	293.4	N/A
114	335	423	317	305	163	308.6	N/A
115	335	423	317	297	162	306.8	N/A
116	336	424	317	357	162	319.2	N/A
117	336	423	317	352	162	318.0	N/A
118	336	424	317	352	161	318.0	N/A
119	337	424	317	345	161	316.8	N/A
120	336	424	317	350	161	317.6	N/A
121	337	424	318	356	161	319.2	N/A
122	338	425	319	346	160	317.6	N/A
123	338	425	319	352	160	318.8	N/A
124	339	425	319	357	160	320.0	N/A
125	339	425	320	358	160	320.4	N/A
126	339	424	320	345	160	317.6	N/A
127	339	423	319	351	159	318.2	N/A
128	339	422	319	358	159	319.4	N/A
129	339	421	319	362	159	320.0	N/A
130	339	420	318	362	159	319.6	N/A
131	340	419	318	361	158	319.2	N/A
132	340	417	318	361	158	318.8	N/A
133	340	416	317	361	158	318.4	N/A
134	341	415	317	360	158	318.2	N/A
135	342	414	317	359	158	318.0	N/A
136	342	413	316	359	157	317.4	N/A
137	343	412	316	357	157	317.0	N/A
138	344	411	316	355	157	316.6	N/A
139	344	410	316	354	157	316.2	N/A
140	346	410	317	352	156	316.2	N/A
141	346	409	317	351	156	315.8	N/A
142	347	409	317	350	156	315.8	N/A
143	348	409	317	350	156	316.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
144	349	408	317	348	156	315.6	N/A	
145	350	408	317	347	156	315.6	N/A	
146	351	407	318	346	156	315.6	N/A	
147	351	406	318	347	156	315.6	N/A	
148	351	406	318	346	156	315.4	N/A	
149	352	405	318	344	156	315.0	N/A	
150	353	402	318	343	156	314.4	N/A	
151	352	402	318	341	156	313.8	N/A	
152	353	400	319	340	156	313.6	N/A	
153	352	398	319	339	156	312.8	N/A	
154	353	397	319	338	156	312.6	N/A	
155	353	395	319	338	156	312.2	N/A	
156	353	393	319	337	156	311.6	N/A	
157	354	393	320	337	156	312.0	N/A	
158	354	391	320	336	156	311.4	N/A	
159	355	391	321	335	156	311.6	N/A	
160	355	389	322	334	156	311.2	N/A	
161	356	388	324	335	156	311.8	N/A	
162	357	387	324	335	156	311.8	N/A	
163	357	386	324	336	156	311.8	N/A	
164	357	384	324	335	156	311.2	N/A	
165	358	384	325	335	156	311.6	N/A	
166	358	383	325	336	156	311.6	N/A	
167	359	383	325	337	156	312.0	N/A	
168	359	382	326	340	156	312.6	N/A	
169	360	382	326	344	156	313.6	N/A	
170	359	381	326	346	156	313.6	N/A	
171	360	380	325	348	155	313.6	N/A	
172	360	379	325	347	155	313.2	N/A	
173	360	379	326	342	155	312.4	N/A	
174	359	379	326	340	155	311.8	N/A	
175	359	378	326	338	155	311.2	N/A	
176	359	377	326	336	155	310.6	N/A	
177	358	378	326	333	155	310.0	N/A	
178	358	377	326	331	155	309.4	N/A	
179	358	377	326	329	155	309.0	N/A	
180	356	376	326	328	155	308.2	N/A	
181	356	375	326	326	155	307.6	N/A	
182	355	375	327	325	155	307.4	N/A	
183	355	374	327	324	155	307.0	N/A	
184	353	373	327	325	155	306.6	N/A	
185	352	373	327	328	155	307.0	N/A	
186	352	373	328	326	155	306.8	N/A	
187	350	372	328	319	155	304.8	N/A	
188	349	372	328	311	155	303.0	N/A	
189	347	371	328	304	155	301.0	N/A	
190	345	370	328	297	155	299.0	N/A	
191	344	370	328	292	155	297.8	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
192	342	369	331	288	155	297.0	N/A	
193	340	369	331	285	155	296.0	N/A	
194	338	368	331	282	155	294.8	N/A	
195	336	367	329	278	155	293.0	N/A	
196	335	366	328	276	155	292.0	N/A	
197	333	365	327	273	155	290.6	N/A	
198	331	365	326	270	155	289.4	N/A	
199	329	364	326	268	155	288.4	N/A	
200	328	363	326	265	155	287.4	N/A	
201	327	363	325	263	155	286.6	N/A	
202	325	361	323	260	155	284.8	N/A	
203	324	361	323	258	155	284.2	N/A	
204	323	360	322	256	155	283.2	N/A	
205	321	359	322	254	155	282.2	N/A	
206	320	359	322	252	155	281.6	N/A	
207	319	358	322	251	155	281.0	N/A	
208	318	356	321	249	155	279.8	N/A	
209	317	356	321	248	155	279.4	N/A	
210	316	355	322	246	155	278.8	N/A	
211	314	354	323	244	155	278.0	N/A	
212	314	353	323	242	155	277.4	N/A	
213	313	353	323	240	155	276.8	N/A	
214	312	352	322	238	156	276.0	N/A	
215	311	351	322	236	156	275.2	N/A	
216	310	351	324	234	156	275.0	N/A	
217	310	350	324	233	156	274.6	N/A	
218	309	349	324	231	156	273.8	N/A	
219	308	349	323	230	156	273.2	N/A	
220	307	348	323	229	156	272.6	N/A	
221	307	347	324	228	156	272.4	N/A	
222	306	347	324	227	156	272.0	N/A	
223	305	347	323	225	156	271.2	N/A	
224	305	346	324	224	157	271.2	N/A	
225	304	345	323	224	157	270.6	N/A	
226	304	345	323	223	157	270.4	N/A	
227	304	345	323	222	157	270.2	N/A	
228	303	344	323	222	157	269.8	N/A	
229	303	343	323	221	157	269.4	N/A	
230	302	343	323	221	157	269.2	N/A	
231	302	343	323	220	157	269.0	N/A	
232	302	342	324	220	157	269.0	N/A	
233	302	341	324	220	158	269.0	N/A	
234	302	342	323	220	158	269.0	N/A	
235	302	341	324	219	158	268.8	N/A	
236	302	341	323	219	158	268.6	N/A	
237	302	341	323	219	158	268.6	N/A	
238	301	340	322	219	159	268.2	N/A	
239	301	340	322	218	159	268.0	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
240	301	340	322	218	159	268.0	N/A	
241	301	339	322	218	159	267.8	N/A	
242	301	339	322	219	159	268.0	N/A	
243	301	338	321	219	159	267.6	N/A	
244	301	338	321	219	160	267.8	N/A	
245	300	338	321	219	160	267.6	N/A	
246	300	337	321	219	160	267.4	N/A	
247	300	337	321	219	160	267.4	N/A	
248	299	337	321	219	160	267.2	N/A	
249	300	337	321	219	161	267.6	N/A	
250	299	336	321	219	161	267.2	N/A	
251	299	337	320	219	161	267.2	N/A	
252	299	336	321	219	161	267.2	N/A	
253	299	336	320	219	161	267.0	N/A	
254	298	336	319	219	161	266.6	N/A	
255	298	335	319	218	162	266.4	N/A	
256	298	334	319	218	162	266.2	N/A	
257	297	334	319	218	162	266.0	N/A	
258	297	334	320	218	162	266.2	N/A	
259	297	334	321	218	162	266.4	N/A	
260	297	334	322	218	163	266.8	N/A	
261	296	333	323	217	163	266.4	N/A	
262	296	334	322	217	163	266.4	N/A	
263	295	333	323	217	163	266.2	N/A	
264	295	333	323	217	163	266.2	N/A	
265	295	333	323	217	163	266.2	N/A	
266	294	332	322	217	164	265.8	N/A	
267	294	332	323	217	164	266.0	N/A	
268	294	332	323	217	164	266.0	N/A	
269	293	332	324	217	164	266.0	N/A	
270	293	331	323	216	164	265.4	N/A	
271	292	331	323	216	164	265.2	N/A	
272	292	330	322	216	165	265.0	N/A	
273	292	330	322	216	165	265.0	N/A	
274	292	330	322	216	165	265.0	N/A	
275	291	330	322	216	165	264.8	N/A	
276	291	330	323	216	165	265.0	N/A	
277	291	330	324	216	165	265.2	N/A	
278	290	330	324	217	165	265.2	N/A	
279	290	329	323	216	166	264.8	N/A	
280	289	329	323	217	166	264.8	N/A	
281	289	329	323	217	166	264.8	N/A	
282	289	329	323	217	166	264.8	N/A	
283	289	329	323	217	166	264.8	N/A	
284	289	329	323	217	166	264.8	N/A	
285	288	329	323	217	166	264.6	N/A	
286	288	329	323	218	167	265.0	N/A	
287	288	329	323	218	167	265.0	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
288	288	329	323	218	167	265.0	N/A	
289	288	329	323	218	167	265.0	N/A	
290	287	329	323	218	167	264.8	N/A	
291	287	329	323	218	167	264.8	N/A	
292	287	329	323	218	167	264.8	N/A	
293	287	329	323	218	168	265.0	N/A	
294	287	329	326	218	168	265.6	N/A	
295	286	329	326	219	168	265.6	N/A	
296	286	329	327	219	168	265.8	N/A	
297	286	329	328	219	168	266.0	N/A	
298	286	330	327	218	168	265.8	N/A	
299	286	329	329	219	168	266.2	N/A	
300	286	330	328	219	168	266.2	N/A	
301	285	329	328	220	169	266.2	N/A	
302	286	330	328	220	169	266.6	N/A	
303	285	330	328	220	169	266.4	N/A	
304	285	330	328	220	169	266.4	N/A	
305	285	330	328	220	169	266.4	N/A	
306	285	330	328	220	169	266.4	N/A	
307	285	331	328	220	169	266.6	N/A	
308	285	331	328	220	169	266.6	N/A	
309	284	331	328	220	169	266.4	N/A	
310	284	331	328	220	170	266.6	N/A	
311	285	331	328	220	170	266.8	N/A	
312	284	331	328	220	170	266.6	N/A	
313	284	331	328	220	170	266.6	N/A	
314	284	331	329	220	170	266.8	N/A	
315	284	331	328	220	170	266.6	N/A	
316	284	331	328	220	170	266.6	N/A	
317	284	331	328	221	170	266.8	N/A	
318	284	331	328	221	170	266.8	N/A	
319	284	331	328	221	170	266.8	N/A	
320	284	331	328	221	171	267.0	N/A	
321	284	330	328	221	171	266.8	N/A	
322	283	330	328	221	171	266.6	N/A	
323	283	330	328	221	171	266.6	N/A	
324	283	329	328	221	171	266.4	N/A	
325	283	330	328	221	171	266.6	N/A	
326	283	330	328	221	171	266.6	N/A	
327	283	330	328	221	171	266.6	N/A	
328	283	329	328	221	171	266.4	N/A	
329	283	330	328	221	171	266.6	N/A	
330	283	329	328	221	171	266.4	N/A	
331	283	329	329	221	171	266.6	N/A	
332	283	329	328	222	171	266.6	N/A	
333	283	329	328	222	172	266.8	N/A	
334	283	329	328	222	171	266.6	N/A	
335	283	329	328	221	172	266.6	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove Works
 Model: 15-W06
 Run #: 3

Job #: 20-601
 Tracking #: 0071
 Technician: AK
 Date: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
336	283	329	327	221	172	266.4	N/A	
337	283	329	328	222	172	266.8	N/A	
338	283	329	328	221	172	266.6	N/A	
339	282	329	328	221	172	266.4	N/A	
340	283	329	327	221	172	266.4	N/A	
341	283	329	327	221	172	266.4	N/A	
342	283	329	328	220	172	266.4	N/A	
343	283	329	328	220	172	266.4	N/A	
344	283	329	328	220	172	266.4	N/A	
345	283	329	327	220	173	266.4	N/A	
346	283	328	327	220	172	266.0	N/A	
347	283	328	327	220	173	266.2	N/A	
348	283	328	328	220	173	266.4	N/A	
349	283	329	328	220	173	266.6	N/A	
350	283	328	328	220	173	266.4	N/A	
351	283	329	327	220	173	266.4	N/A	
352	283	329	328	220	173	266.6	N/A	
353	283	328	327	220	173	266.2	N/A	
354	283	329	327	220	173	266.4	N/A	
355	283	329	326	220	173	266.2	N/A	
356	283	329	325	220	173	266.0	N/A	
357	283	329	325	220	173	266.0	N/A	
358	283	329	325	220	173	266.0	N/A	
359	283	330	325	221	173	266.4	N/A	
360	283	330	325	221	174	266.6	N/A	
361	284	330	325	221	174	266.8	N/A	
362	283	330	325	221	174	266.6	N/A	
363	284	330	323	221	174	266.4	N/A	
364	283	330	323	221	174	266.2	N/A	
365	284	330	323	221	174	266.4	N/A	
366	284	331	323	221	174	266.6	N/A	
367	284	331	324	221	174	266.8	N/A	
368	284	331	325	221	174	267.0	N/A	
369	284	331	325	221	174	267.0	N/A	
370	284	331	325	222	174	267.2	N/A	
371	284	332	325	222	175	267.6	N/A	
372	284	332	326	222	175	267.8	N/A	
373	284	331	326	222	175	267.6	N/A	
374	284	332	326	222	175	267.8	N/A	
375	284	332	326	222	175	267.8	N/A	
376	284	332	325	222	175	267.6	N/A	
377	285	332	324	222	175	267.6	N/A	
378	285	332	324	222	175	267.6	N/A	
379	285	333	324	223	175	268.0	N/A	
380	285	333	324	223	175	268.0	N/A	
381	285	332	324	223	175	267.8	N/A	
382	285	332	324	222	175	267.6	N/A	
383	285	332	324	222	175	267.6	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
384	285	332	324	223	176	268.0	N/A	
385	285	331	324	222	176	267.6	N/A	
386	285	331	323	222	176	267.4	N/A	
387	285	331	323	222	176	267.4	N/A	
388	285	331	323	223	176	267.6	N/A	
389	285	331	322	223	176	267.4	N/A	
390	285	331	322	223	176	267.4	N/A	
391	286	331	322	223	176	267.6	N/A	
392	285	331	321	223	176	267.2	N/A	
393	286	332	321	223	176	267.6	N/A	
394	286	331	321	223	176	267.4	N/A	
395	286	332	321	223	176	267.6	N/A	
396	286	332	321	223	176	267.6	N/A	
397	287	332	321	223	176	267.8	N/A	
398	287	332	321	223	176	267.8	N/A	
399	287	331	322	223	176	267.8	N/A	
400	287	332	322	224	176	268.2	N/A	
401	288	331	322	224	176	268.2	N/A	
402	288	331	321	223	176	267.8	N/A	
403	288	331	320	223	176	267.6	N/A	
404	288	331	320	223	176	267.6	N/A	
405	289	331	321	223	176	268.0	N/A	
406	288	330	320	223	176	267.4	N/A	
407	288	331	320	223	176	267.6	N/A	
408	288	330	322	222	177	267.8	N/A	
409	288	330	325	222	176	268.2	N/A	
410	288	330	325	222	176	268.2	N/A	
411	288	329	327	222	176	268.4	N/A	
412	287	329	327	221	176	268.0	N/A	
413	287	329	328	221	176	268.2	N/A	
414	287	328	326	221	176	267.6	N/A	
415	287	328	323	221	176	267.0	N/A	
416	287	328	322	221	176	266.8	N/A	
417	287	328	321	221	176	266.6	N/A	
418	287	327	320	221	176	266.2	N/A	
419	286	327	320	221	176	266.0	N/A	
420	286	326	317	221	176	265.2	N/A	
421	286	326	316	221	176	265.0	N/A	
422	286	326	315	221	176	264.8	N/A	
423	285	326	315	221	176	264.6	N/A	
424	285	325	313	221	175	263.8	N/A	
425	285	325	312	221	175	263.6	N/A	
426	284	325	312	220	175	263.2	N/A	
427	284	324	311	220	175	262.8	N/A	
428	284	324	311	220	175	262.8	N/A	
429	284	323	310	219	175	262.2	N/A	
430	284	323	309	219	175	262.0	N/A	
431	284	323	308	219	175	261.8	N/A	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
432	284	322	308	219	175	261.6	N/A
433	283	322	308	219	175	261.4	N/A
434	283	321	307	218	175	260.8	N/A
435	283	321	307	218	174	260.6	N/A
436	283	321	307	218	174	260.6	N/A
437	283	320	306	217	174	260.0	N/A
438	282	320	306	217	174	259.8	N/A
439	282	320	306	217	174	259.8	N/A
440	283	319	306	217	174	259.8	N/A
441	282	319	306	217	174	259.6	N/A
442	282	318	306	217	174	259.4	N/A
443	281	318	305	217	173	258.8	N/A
444	282	318	305	217	173	259.0	N/A
445	281	317	305	217	173	258.6	N/A
446	281	317	304	216	173	258.2	N/A
447	281	317	304	216	173	258.2	N/A
448	281	316	304	216	173	258.0	N/A
449	281	316	303	216	173	257.8	N/A
450	280	315	303	215	172	257.0	N/A
451	280	315	302	215	172	256.8	N/A
452	279	314	302	215	172	256.4	N/A
453	279	314	302	215	172	256.4	N/A
454	279	314	301	214	172	256.0	N/A
455	279	313	301	214	171	255.6	N/A
456	279	312	300	214	171	255.2	N/A
457	279	312	301	214	171	255.4	N/A
458	278	312	300	214	171	255.0	N/A
459	278	311	299	214	170	254.4	N/A
460	278	311	299	214	170	254.4	N/A
461	278	310	297	214	170	253.8	N/A
462	277	310	297	214	170	253.6	N/A
463	277	310	296	213	170	253.2	N/A
464	277	309	296	213	170	253.0	N/A
465	277	309	296	213	169	252.8	N/A
466	276	308	295	213	169	252.2	N/A
467	277	308	295	213	169	252.4	N/A
468	276	308	295	213	169	252.2	N/A
469	276	307	295	213	169	252.0	N/A
470	276	307	294	213	169	251.8	N/A
471	276	307	298	212	168	252.2	N/A
472	276	307	297	212	168	252.0	N/A
473	275	306	296	212	168	251.4	N/A
474	275	306	296	212	168	251.4	N/A
475	275	306	297	212	168	251.6	N/A
476	275	305	296	212	167	251.0	N/A
477	275	304	298	211	167	251.0	N/A
478	274	304	297	211	167	250.6	N/A
479	274	304	298	212	167	251.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (*F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	273	303	298	211	167	250.4	N/A
481	274	303	297	211	167	250.4	N/A
482	273	303	298	211	167	250.4	N/A
483	273	302	297	210	167	249.8	N/A
484	272	301	298	211	166	249.6	N/A
485	272	301	296	211	166	249.2	N/A
486	271	301	294	210	166	248.4	N/A
487	272	300	291	210	166	247.8	N/A
488	272	299	289	209	166	247.0	N/A
489	271	299	289	209	166	246.8	N/A
490	271	299	289	209	166	246.8	N/A
491	270	298	289	209	165	246.2	N/A
492	270	298	289	209	165	246.2	N/A
493	270	298	290	209	165	246.4	N/A
494	270	297	289	209	165	246.0	N/A
495	269	297	289	209	165	245.8	N/A
496	269	297	288	209	165	245.6	N/A
497	268	296	287	209	165	245.0	N/A
498	268	295	287	209	165	244.8	N/A
499	268	295	287	209	164	244.6	N/A
500	267	295	287	209	164	244.4	N/A
501	267	294	286	209	164	244.0	N/A
502	267	293	284	209	164	243.4	N/A
503	266	293	282	209	164	242.8	N/A
504	266	293	281	209	164	242.6	N/A
505	266	293	281	209	164	242.6	N/A
506	265	291	280	209	164	241.8	N/A
507	265	291	279	209	163	241.4	N/A
508	264	291	283	208	163	241.8	N/A
509	264	290	282	208	163	241.4	N/A
510	263	290	282	208	163	241.2	N/A
511	264	290	280	208	163	241.0	N/A
512	263	290	280	208	163	240.8	N/A
513	263	289	278	207	163	240.0	N/A
514	263	289	278	207	162	239.8	N/A
515	263	288	280	206	162	239.8	N/A
516	262	287	280	206	162	239.4	N/A
517	262	287	281	206	162	239.6	N/A
518	261	286	281	205	162	239.0	N/A
519	261	286	280	205	162	238.8	N/A
520	260	286	280	204	161	238.2	N/A
521	260	285	283	204	161	238.6	N/A
522	259	284	282	204	161	238.0	N/A
523	259	284	281	203	161	237.6	N/A
524	258	283	280	203	161	237.0	N/A
525	257	282	282	203	161	237.0	N/A
526	257	282	278	203	161	236.2	N/A
527	256	281	281	203	161	236.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: England's Stove WorksJob #: 20-601Model: 15-W06Tracking #: 0071Run #: 3Technician: AKDate: 5/18/2020

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
528	256	280	280	203	161	236.0	N/A
529	255	280	284	202	161	236.4	N/A
530	254	279	285	203	160	236.2	N/A
531	254	278	284	202	160	235.6	N/A
532	253	278	284	203	160	235.6	N/A
533	253	277	285	202	160	235.4	N/A
534	253	276	287	202	160	235.6	N/A
535	252	276	286	202	160	235.2	N/A
536	251	276	285	202	160	234.8	N/A
537	250	275	285	202	160	234.4	N/A
538	250	275	284	202	160	234.2	N/A
539	249	274	283	202	160	233.6	N/A
540	249	274	283	201	160	233.4	N/A
541	248	273	282	201	160	232.8	N/A
542	248	272	281	201	159	232.2	N/A
543	248	272	282	200	159	232.2	N/A
544	247	272	280	200	159	231.6	N/A
Average	309	358	322	240	173	280	N/A

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 20-601 Tracking #: 71
 Model: 15-W06 Run Number: 3 Test Date: 5/18/20

Wood Heater Run Notes

Pre-Test Notes

Pre-Test Start Time: 11:23
 Air Control Setting: Fully open

Time	Notes
0-60 sec	Torch Ignition
4:00	Closed door
38:00	Loaded test fuel
40:00	Closed Door

Test Notes

Test Burn Start Time: 11:45
 Air Control Setting: 1" open

Time	Notes
0:40	Fuel loaded
1:20	Closed door, air set to fully open
15:00	Air adjusted to test setting
60:00	Changed filter A

Test Burn End Time: 23:37

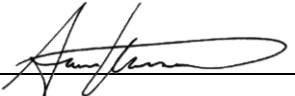
Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO₂ (%): 16.90 CO (%): 4.18
 Mid Gas CO₂ (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	5/18 10:15	5/18 10:20	5/18 10:17	5/19 12:10	5/19 10:2:14	5/19 12:16
CO ₂	0.00	9.98	16.90	0.00	9.92	16.88
CO	0.000	2.433	4.180	0.002	2.433	4.176

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

Technician Signature: 

Date: 5/28/2020
 Page 1 of 3

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works
Model: 15-W06

Job Number: 20-601
Run Number: 3

Tracking #: 71
Test Date: 5/18/20

Test Photos



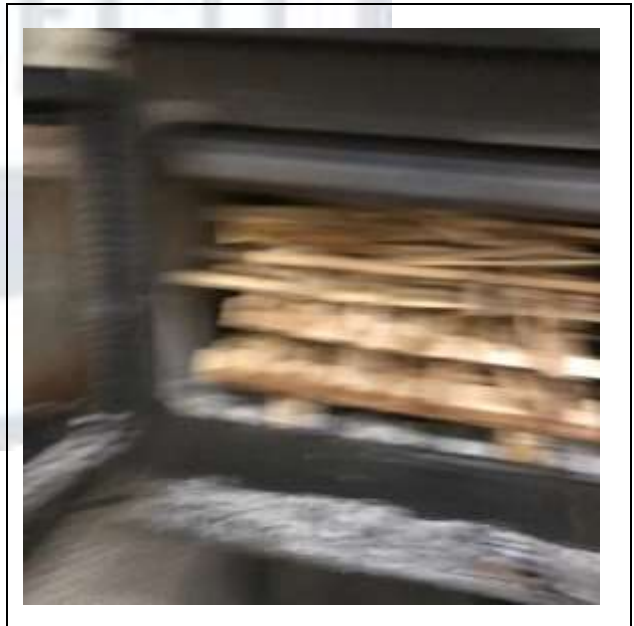
Kindling Fuel Load



Start-up Fuel Load



High Fire Fuel Load



Kindling Loaded

Technician Signature: _____

Date: 5/28/2020
Page 2 of 3

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works

Job Number: 20-601

Tracking #: 71

Model: 15-W06

Run Number: 3

Test Date: 5/18/20



Medium Fire Fuel Load



Medium Fire Fuel Loaded



Technician Signature: _____

Date: 5/28/2020
Page 3 of 3

ASTM E2515 - Glass Filters

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
3721	120.9	120.7	-	-	SB	19-551	#4
3722	120.8	120.7	-	-	SB	↓	↓
3723	119.9	119.9	-	-	SB	↓	↓
3724	118.7	118.8	-	-	SB	—	—
3725	120.7	120.6	-	-	SB	20-568	#1
3726	120.5	120.6	-	-	SB	↓	↓
3727	119.4	119.5	-	-	SB	↓	↓
3728	118.4	118.6	-	-	SB	↓	↓
3729	123.0	122.8	-	-	SB	↓	↓
3730	121.7	121.5	-	-	SB	↓	↓
3731	119.8	119.8	-	-	SB	20-585	Sample
3732	119.5	119.5	-	-	SB	↓	Blank
3733	119.0	118.9	-	-	SB	20-585	#1
3734	118.3	118.5	-	-	SB	↓	↓
3735	119.4	119.2	-	-	SB	↓	↓
3736	119.2	119.2	-	-	SB	↓	↓
3737	117.7	117.5	-	-	SB	↓	↓
3738	119.8	119.6	-	-	SB	20-585	#2

Weight 1 Date/Time:
12/5- 9:00
Weight 2 Date/Time:
12/6- 10:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
3739	119.1	119.1	-	-	A	20-585	#2
3740	119.2	119.1	-	-	A	↓	↓
3741	118.8	118.9	-	-	A	↓	↓
3742	118.7	118.7	-	-	A	↓	↓
3743	118.4	118.6	-	-	A	20-585	#3
3744	119.3	118.4	-	-	A	↓	↓
3745	119.4	119.5	-	-	A	↓	↓
3746	119.6	119.8	-	-	A	↓	↓
3747	119.2	119.2	-	-	A	↓	↓
3748	118.5	118.7	-	-	A	20-587	#1
3749	119.2	119.4	-	-	A	↓	↓
3750	119.0	119.0	-	-	A	↓	↓
3751	118.7	118.7	-	-	A	↓	↓
3752	119.2	119.1	-	-	A	↓	↓
3753	118.3	118.2	-	-	A	↓	↓
3754	118.4	118.3	-	-	A	↓	#2
3755	119.0	119.0	-	-	A	↓	↓
3756	119.5	119.5	-	-	A	↓	↓

Weight 1 Date/Time:
1/8/19 0845
Weight 2 Date/Time:
1/8/19 - 0815
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - Glass Filters

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
3757	118.7	118.9	-	-	A	20-597	#2
3758	120.5	120.3	-	-	A		↓
3759	119.1	119.2	-	-	A		↓
3760	119.64	119.2	-	-	A		#3
3761	119.7	119.8	-	-	A		↓
3762	119.1	119.3	-	-	A		↓
3763	118.4	118.6	-	-	A		↓
3764	119.1	119.3	-	-	A		↓
3765	118.7	118.7	-	-	A		↓
3766	119.3	119.4	-	-	A		#4
3767	120.3	120.2	-	-	A		↓
3768	117.9	118.0	-	-	A		↓
3769	119.3	119.4	-	-	A		↓
3770	120.0	119.9	-	-	A		↓
3771	238.9	119.8	119.7	-	A	↓	↓
3772	119.5	119.7	-	-	A	20-565	#1
3773	119.4	119.3	-	-	A	↓	↓
3774	118.9	118.9	-	-	A	↓	↓

Weight 1 Date/Time:
4/24 16:30
Weight 2 Date/Time:
4/25 12:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
3775	118.1	118.2	-	-	A	20-565	#1
3776	119.5	119.6	-	-	A		#2
3777	119.3	119.2	-	-	A		↓
3778	119.1	119.0	-	-	A		↓
3779	119.2	119.2	-	-	A		↓
3780	120.4	120.1	120.2	-	A		#3
3781	121.7	121.4	121.5	-	A		↓
3782	119.8	119.2	119.4	-	A		↓
3783	120.1	120.1	-	-	A		↓
3784	121.0	120.8	-	-	A		#4
3785	119.0	118.8	-	-	A		↓
3786	118.6	118.4	-	-	A		↓
3787	120.6	120.5	-	-	A	↓	↓
3788	120.9	120.8	-	-	A		
3789	119.1	119.1	-	-	A		
3790	119.0	119.0	-	-	A		
3791	121.5	121.4	-	-	A		
3792	121.3	121.4	-	-	A		

Weight 1 Date/Time:
4/24 15:30
Weight 2 Date/Time:
4/25 12:30
Weight 3 Date/Time:
4/26 08:45
Weight 4 Date/Time:

ASTM E2515 - TX Filters

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

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

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
T449	94.6	94.8	-	-	A	19-471	#2
T450	94.3	94.3	-	-	A		#1
T451	94.1	94.1	-	-	A		#2
T452	93.8	93.9	-	-	A		#2
T453	94.2	94.2	-	-	A		#2
T454	94.0	94.2	-	-	A		#2
T455	96.6	96.7	-	-	A	19-471	#3
T456	97.4	97.5	-	-	A		#3
T457	96.9	97.0	-	-	A		#3
T458	97.6	97.4	-	-	A		#3
T459	96.8	96.9	-	-	A		#3
T460	96.7	96.6	-	-	A		#3
T461	96.9	96.9	-	-	A		#3
T462	96.8	96.8	-	-	A		#3
T463	94.9	94.7	-	-	A	20-601	#1
T464	94.7	94.7	-	-	A		
T465	95.2	95.1	-	-	A		
T466	95.3	95.3	-	-	A		

Weight 1 Date/Time:
3/20 15:00
Weight 2 Date/Time:
4/21 16:45
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - TX Filters

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
T467	96.5	96.5	-	-	SB	20-601	#1
T468	94.9	95.0	-	-	SB	20-601	#2
T469	94.3	94.4	-	-	SB	↓	↓
T470	94.2	94.3	-	-	SB	↓	↓
T471	93.9	93.9	-	-	SB	↓	↓
T472	93.8	93.9	-	-	SB	↓	↓
T473	94.0	94.0	-	-	SB	20-601	#3
T474	93.6	93.8	-	-	SB	↓	↓
T475	93.5	93.5	-	-	SB	↓	↓
T476	94.1	94.1	-	-	SB	↓	↓
T477	94.1	94.1	-	-	SB	↓	↓
T478	94.1	94.1	-	-	SB		
T479	94.2	94.1	-	-	SB		
T480	96.7	96.6	-	-	SB		
T481	96.4	96.2	-	-	SB		
T482	96.4	96.2	-	-	SB		
T483	96.1	96.2	-	-	SB		
T484	96.5	96.5	-	-	SB		

Weight 1 Date/Time:
5/6-14:00
Weight 2 Date/Time:
5/14-13:00
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
T485							
T486							
T487							
T488							
T489							
T490							
T491							
T492							
T493							
T494							
T495							
T496							
T497							
T498							
T499							
T500							
T501							
T502							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - O-Rings

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	3570.6	3566.2	3566.7	3566.8	A	20-565	#4
1B	3554.6	3554.0	3555.0	-	A		
2A	3552.4	3552.5	-	-	A	20-601	#1
2B	3571.5	3571.6	-	-	A		
3A	3570.7	3579.8	-	-	A	20-601	#2
3B	3568.0	3578.2	-	-	A		
4A	3622.1	3623.6	3623.8	-	A	20-601	#3
4B	3570.9	3580.2	3580.7	-	A		
5A	3534.1	3534.9	3535.0	-	A		
5B	3530.6	3531.4	3531.5	-	A		

Weight 1 Date/Time: 4/23 16:00
Weight 2 Date/Time: 4/24 0830
Weight 3 Date/Time: 4/25 12:00
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A							
6B							
7A							
7B							
8A							
8B							
9A							
9B							
10A							
10B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A							
11B							
12A							
12B							
13A							
13B							
14A							
14B							
15A							
15B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A							
16B							
17A							
17B							
18A							
18B							
19A							
19B							
20A							
20B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - O-Rings

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

Weight 1 Date/Time:	2/28 - 8:00
Weight 2 Date/Time:	2/28 - 15:30
Weight 3 Date/Time:	3/26 - 15:00
Weight 4 Date/Time:	

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A	3613.8	3613.9	3614.0	3614.1	SB	20-583	#2
6B	3393.8	3394.4	3394.5	3394.8	SB		
7A	3571.6	3571.8	3571.9	3571.9	SB	20-583	#3
7B	3520.8	352	3521.3	3521.4	SB		
8A	3550.3		3550.4	3550.5	SB	20-592	#1
8B	3584.1		3584.4	3584.5	SB		
9A	3579.8		3580.1	3580.2	SB	20-592	#2
9B	3522.8		3523.2	3523.2	SB		
10A	3428.5		3429.3	3429.4	SB	20-592	#3
10B	3569.4		3569.6	3569.6	SB		

Weight 1 Date/Time:	3/26 - 15:00
Weight 2 Date/Time:	3/31 - 15:00
Weight 3 Date/Time:	4/2 - 9:00
Weight 4 Date/Time:	

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	3422.1	3422.3	-	-	SB	19-471	#1
11B	4232.9	4233.1	-	-	SB		
12A	3393.6	3393.8	-	-	SB	19-471	#2
12B	3404.0	3404.1	-	-	SB		
13A	3358.8	3358.4	-	-	SB	19-471	#3
13B	3443.3	3443.5	-	-	SB		
14A	3365.3	3365.5	-	-	SB	20-597	#1
14B	3339.8	3340.0	-	-	SB		
15A	3560.1	3560.0	-	-	SB	20-597	#2
15B	3569.6	3569.7	-	-	SB		

Weight 1 Date/Time:	4/20 17:00
Weight 2 Date/Time:	4/21 16:30
Weight 3 Date/Time:	
Weight 4 Date/Time:	

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A	3573.0	3573.1	-	-	SB	20-597	#3
16B	3638.9	3638.8	-	-	SB		
17A	3612.1	3612.2	-	-	SB	20-597	#4
17B	3568.4	3568.5	-	-	SB		
18A	3395.9	3396.1	-	-	SB	20-565	#1
18B	3367.5	3367.7	-	-	SB		
19A	3365.8	3366.0	-	-	SB	20-565	#2
19B	3438.6	3438.8	-	-	SB		
20A	3392.2	3392.4	-	-	SB	20-565	#3
20B	3425.2	3525.4	-	-	SB		

Weight 1 Date/Time:	4/20 17:00
Weight 2 Date/Time:	4/21 16:30
Weight 3 Date/Time:	
Weight 4 Date/Time:	

ASTM E2515 - Probes

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	115628.0	115627.9	-	-	A	20-565	#4
1B	115900.6	115900.4	-	-	B		
2A	116239.6	116239.5	-	-	A	20-601	#1
2B	116328.7	116328.5	-	-	B		
3A	116074.0	116073.9	-	-	1	20-601	#2
3B	116338.8	116338.9	-	-	1		
4A	116183.2	116182.0	116183.1	116183.1	A	20-601	#3
4B	116366.9	116366.4	116366.6	-	B		
5A	116767.1	116766.8	116767.0	-	A		
5B	116874.9	116874.4	116874.6	-	B		

Weight 1 Date/Time: 4/23 17:00
Weight 2 Date/Time: 4/24 08:30
Weight 3 Date/Time: 4/26 09:30
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A							
6B							
7A							
7B							
8A							
8B							
9A							
9B							
10A							
10B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A							
11B							
12A							
12B							
13A							
13B							
14A							
14B							
15A							
15B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A							
16B							
17A							
17B							
18A							
18B							
19A							
19B							
20A							
20B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - Probes

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

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

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

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

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

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A	116543.7	116543.6	-	-	A	20-583	#2
6B	116118.2	116118.1	-	-	A		
7A	116739.4	116739.3	-	-	A	20-583	#3
7B	117286.7	117286.5	-	-	A		
8A	116209.5	116289.6	-	-	A	20-592	#1
8B	116326.3	116426.3	-	-	A		
9A	116713.6	116713.8	-	-	A	20-592	#2
9B	117919.3	117919.3	-	-	A		
10A	116819.6	116819.6	-	-	A	20-592	#3
10B	117903.5	117903.6	-	-	A		

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

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

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	117035.6	117035.8	-	-	A	19-471	#1
11B	117489.5	117489.7	-	-	A		
12A	116889.1	116889.3	-	-	A	19-471	#2
12B	117941.5	117941.7	-	-	A		
13A	117455.8	117455.0	-	-	A	19-471	#3
13B	117054.9	117054.9	-	-	A		
14A	116818.0	116818.0	-	-	A	20-597	#1
14B	116771.9	116771.8	-	-	A		
15A	117418.0	117418.0	-	-	A	20-597	#2
15B	116904.9	116909.0	-	-	A		

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

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

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A	116537.5	116537.3	-	-	A	20-597	#3
16B	116034.1	116034.0	-	-	A		
17A	116810.5	116810.5	-	-	A	20-597	#4
17B	117139.0	117138.9	-	-	A		
18A	117406.9	117406.5	-	-	A	20-565	#1
18B	117320.6	117320.5	-	-	A		
19A	117025.3	117025.1	-	-	A	20-565	#2
19B	117011.0	117011.7	-	-	A		
20A	115625.7	115625.5	-	-	A	20-565	#3
20B	115964.0	115964.7	-	-	A		

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

Weight 2 Date/Time:
4/24 0830

Weight 3 Date/Time:

Weight 4 Date/Time:

ASTM E2515 - Glass Filters

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
3721	120.9	120.7	-	-	SB	19-551	#4
3722	120.8	120.7	-	-	SB	↓	↓
3723	119.9	119.9	-	-	SB	↓	↓
3724	118.7	118.8	-	-	SB	—	—
3725	120.7	120.6	-	-	SB	20-568	#1
3726	120.5	120.6	-	-	SB	↓	↓
3727	119.4	119.5	-	-	SB	↓	↓
3728	118.4	118.6	-	-	SB	↓	↓
3729	123.0	122.8	-	-	SB	↓	↓
3730	121.7	121.5	-	-	SB	↓	↓
3731	119.8	119.8	-	-	SB	20-585	Sample
3732	119.5	119.5	-	-	SB	↓	Blank
3733	119.0	118.9	-	-	SB	20-585	#1
3734	118.3	118.5	-	-	SB	↓	↓
3735	119.4	119.2	-	-	SB	↓	↓
3736	119.2	119.2	-	-	SB	↓	↓
3737	117.7	117.5	-	-	SB	↓	↓
3738	119.8	119.6	-	-	SB	20-585	#2

Weight 1 Date/Time:
12/5- 9:00
Weight 2 Date/Time:
12/6- 10:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
3739	119.1	119.1	-	-	A	20-585	#2
3740	119.2	119.1	-	-	A	↓	↓
3741	118.8	118.9	-	-	A	↓	↓
3742	118.7	118.7	-	-	A	↓	↓
3743	118.4	118.6	-	-	A	20-585	#3
3744	119.3	118.4	-	-	A	↓	↓
3745	119.4	119.5	-	-	A	↓	↓
3746	119.6	119.8	-	-	A	↓	↓
3747	119.2	119.2	-	-	A	↓	↓
3748	118.5	118.7	-	-	A	20-587	#1
3749	119.2	119.4	-	-	A	↓	↓
3750	119.0	119.0	-	-	A	↓	↓
3751	118.7	118.7	-	-	A	↓	↓
3752	119.2	119.1	-	-	A	↓	↓
3753	118.3	118.2	-	-	A	↓	↓
3754	118.4	118.3	-	-	A	↓	#2
3755	119.0	119.0	-	-	A	↓	↓
3756	119.5	119.5	-	-	A	↓	↓

Weight 1 Date/Time:
1/8/19 0845
Weight 2 Date/Time:
1/8/19 - 0815
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - Glass Filters

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
3757	118.7	118.9	-	-	A	20-597	#2
3758	120.5	120.3	-	-	A		↓
3759	119.1	119.2	-	-	A		↓
3760	119.64	119.2	-	-	A		#3
3761	119.7	119.8	-	-	A		↓
3762	119.1	119.3	-	-	A		↓
3763	118.4	118.6	-	-	A		↓
3764	119.1	119.3	-	-	A		↓
3765	118.7	118.7	-	-	A		↓
3766	119.3	119.4	-	-	A		#4
3767	120.3	120.2	-	-	A		↓
3768	117.9	118.0	-	-	A		↓
3769	119.3	119.4	-	-	A		↓
3770	120.0	119.9	-	-	A		↓
3771	238.9	119.8	119.7	-	A	↓	↓
3772	119.5	119.7	-	-	A	20-565	#1
3773	119.4	119.3	-	-	A	↓	↓
3774	118.9	118.9	-	-	A	↓	↓

Weight 1 Date/Time:
4/24 16:30
Weight 2 Date/Time:
4/25 12:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
3775	118.1	118.2	-	-	A	20-565	#1
3776	119.5	119.6	-	-	A		#2
3777	119.3	119.2	-	-	A		↓
3778	119.1	119.0	-	-	A		↓
3779	119.2	119.2	-	-	A		↓
3780	120.4	120.1	120.2	-	A		#3
3781	121.7	121.4	121.5	-	A		↓
3782	119.8	119.2	119.4	-	A		↓
3783	120.1	120.1	-	-	A		↓
3784	121.0	120.8	-	-	A		#4
3785	119.0	118.8	-	-	A		↓
3786	118.6	118.4	-	-	A		↓
3787	120.6	120.5	-	-	A	↓	↓
3788	120.9	120.8	-	-	A		
3789	119.1	119.1	-	-	A		
3790	119.0	119.0	-	-	A		
3791	121.5	121.4	-	-	A		
3792	121.3	121.4	-	-	A		

Weight 1 Date/Time:
4/24 15:30
Weight 2 Date/Time:
4/25 12:30
Weight 3 Date/Time:
4/26 08:45
Weight 4 Date/Time:

ASTM E2515 - TX Filters

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

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

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
T449	94.6	94.8	-	-	A	19-471	#2
T450	94.3	94.3	-	-	A		#1
T451	94.1	94.1	-	-	A		#2
T452	93.8	93.9	-	-	A		#2
T453	94.2	94.2	-	-	A		#2
T454	94.0	94.2	-	-	A		#2
T455	96.6	96.7	-	-	A	19-471	#3
T456	97.4	97.5	-	-	A		#3
T457	96.9	97.0	-	-	A		#3
T458	97.6	97.4	-	-	A		#3
T459	96.8	96.9	-	-	A		#3
T460	96.7	96.6	-	-	A		#3
T461	96.9	96.9	-	-	A		#3
T462	96.8	96.8	-	-	A		#3
T463	94.9	94.7	-	-	A	20-601	#1
T464	94.7	94.7	-	-	A		
T465	95.2	95.1	-	-	A		
T466	95.3	95.3	-	-	A		

Weight 1 Date/Time:	3/20 15:00
Weight 2 Date/Time:	4/21 16:45
Weight 3 Date/Time:	
Weight 4 Date/Time:	

ASTM E2515 - TX Filters

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
T467	96.5	96.5	-	-	SB	20-601	#1
T468	94.9	95.0	-	-	SB	20-601	#2
T469	94.3	94.4	-	-	SB	↓	↓
T470	94.2	94.3	-	-	SB	↓	↓
T471	93.9	93.9	-	-	SB	↓	↓
T472	93.8	93.9	-	-	SB	↓	↓
T473	94.0	94.0	-	-	SB	20-601	#3
T474	93.6	93.8	-	-	SB	↓	↓
T475	93.5	93.5	-	-	SB	↓	↓
T476	94.1	94.1	-	-	SB	↓	↓
T477	94.1	94.1	-	-	SB	↓	↓
T478	94.1	94.1	-	-	SB		
T479	94.2	94.1	-	-	SB		
T480	96.7	96.6	-	-	SB		
T481	96.4	96.2	-	-	SB		
T482	96.4	96.2	-	-	SB		
T483	96.1	96.2	-	-	SB		
T484	96.5	96.5	-	-	SB		

Weight 1 Date/Time:
5/6-14:00
Weight 2 Date/Time:
5/14-13:00
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
T485							
T486							
T487							
T488							
T489							
T490							
T491							
T492							
T493							
T494							
T495							
T496							
T497							
T498							
T499							
T500							
T501							
T502							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - O-Rings

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	3570.6	3566.2	3566.7	3566.8	A	20-565	#4
1B	3554.6	3554.0	3555.0	-	A		
2A	3552.4	3552.5	-	-	A	20-601	#1
2B	3571.5	3571.6	-	-	A		
3A	3570.7	3579.8	-	-	A	20-601	#2
3B	3568.0	3578.2	-	-	A		
4A	3622.1	3623.6	3623.8	-	A	20-601	#3
4B	3570.9	3580.2	3580.7	-	A		
5A	3534.1	3534.9	3535.0	-	A		
5B	3530.6	3531.4	3531.5	-	A		

Weight 1 Date/Time: 4/23 16:00
Weight 2 Date/Time: 4/24 0830
Weight 3 Date/Time: 4/25 12:00
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A							
6B							
7A							
7B							
8A							
8B							
9A							
9B							
10A							
10B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A							
11B							
12A							
12B							
13A							
13B							
14A							
14B							
15A							
15B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A							
16B							
17A							
17B							
18A							
18B							
19A							
19B							
20A							
20B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - O-Rings

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

Weight 1 Date/Time:	2/28 - 8:00
Weight 2 Date/Time:	2/28 - 15:30
Weight 3 Date/Time:	3/26 - 15:00
Weight 4 Date/Time:	

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A	3613.8	3613.9	3614.0	3614.1	SB	20-583	#2
6B	3393.8	3394.4	3394.5	3394.8	SB		
7A	3571.6	3571.8	3571.9	3571.9	SB	20-583	#3
7B	3520.8	352	3521.3	3521.4	SB		
8A	3550.3		3550.4	3550.5	SB	20-592	#1
8B	3584.1		3584.4	3584.5	SB		
9A	3579.8		3580.1	3580.2	SB	20-592	#2
9B	3522.8		3523.2	3523.2	SB		
10A	3428.5		3429.3	3429.4	SB	20-592	#3
10B	3569.4		3569.6	3569.6	SB		

Weight 1 Date/Time:	3/26 - 15:00
Weight 2 Date/Time:	3/31 - 15:00
Weight 3 Date/Time:	4/2 - 9:00
Weight 4 Date/Time:	

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	3422.1	3422.3	-	-	SB	19-471	#1
11B	4232.9	4233.1	-	-	SB		
12A	3393.6	3393.8	-	-	SB	19-471	#2
12B	3404.0	3404.1	-	-	SB		
13A	3358.8	3358.4	-	-	SB	19-471	#3
13B	3443.3	3443.5	-	-	SB		
14A	3365.3	3365.5	-	-	SB	20-597	#1
14B	3339.8	3340.0	-	-	SB		
15A	3560.1	3560.0	-	-	SB	20-597	#2
15B	3569.6	3569.7	-	-	SB		

Weight 1 Date/Time:	4/20 17:00
Weight 2 Date/Time:	4/21 16:30
Weight 3 Date/Time:	
Weight 4 Date/Time:	

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A	3573.0	3573.1	-	-	SB	20-597	#3
16B	3638.9	3638.8	-	-	SB		
17A	3612.1	3612.2	-	-	SB	20-597	#4
17B	3568.4	3568.5	-	-	SB		
18A	3395.9	3396.1	-	-	SB	20-565	#1
18B	3367.5	3367.7	-	-	SB		
19A	3365.8	3366.0	-	-	SB	20-565	#2
19B	3438.6	3438.8	-	-	SB		
20A	3392.2	3392.4	-	-	SB	20-565	#3
20B	3425.2	3525.4	-	-	SB		

Weight 1 Date/Time:	4/20 17:00
Weight 2 Date/Time:	4/21 16:30
Weight 3 Date/Time:	
Weight 4 Date/Time:	

ASTM E2515 - Probes

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	115628.0	115627.9	-	-	A	20-565	#4
1B	115900.6	115900.4	-	-	B		
2A	116239.6	116239.5	-	-	A	20-601	#1
2B	116328.7	116328.5	-	-	B		
3A	116074.0	116073.9	-	-	1	20-601	#2
3B	116338.8	116338.9	-	-	1		
4A	116183.2	116182.0	116183.1	116183.1	A	20-601	#3
4B	116366.9	116366.4	116366.6	-	B		
5A	116767.1	116766.8	116767.0	-	A		
5B	116874.9	116874.4	116874.6	-	B		

Weight 1 Date/Time:
4/23 17:00

Weight 2 Date/Time:
4/24 08:30

Weight 3 Date/Time:
4/26 09:30

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A							
6B							
7A							
7B							
8A							
8B							
9A							
9B							
10A							
10B							

Weight 1 Date/Time:

Weight 2 Date/Time:

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A							
11B							
12A							
12B							
13A							
13B							
14A							
14B							
15A							
15B							

Weight 1 Date/Time:

Weight 2 Date/Time:

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A							
16B							
17A							
17B							
18A							
18B							
19A							
19B							
20A							
20B							

Weight 1 Date/Time:

Weight 2 Date/Time:

Weight 3 Date/Time:

Weight 4 Date/Time:

ASTM E2515 - Probes

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

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

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

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

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

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A	116543.7	116543.6	-	-	A	20-583	#2
6B	116118.2	116118.1	-	-	A		
7A	116739.4	116739.3	-	-	A	20-583	#3
7B	117286.7	117286.5	-	-	A		
8A	116209.5	116289.6	-	-	A	20-592	#1
8B	116326.3	116426.3	-	-	A		
9A	116713.6	116713.8	-	-	A	20-592	#2
9B	117919.3	117919.3	-	-	A		
10A	116819.6	116819.6	-	-	A	20-592	#3
10B	117903.5	117903.6	-	-	A		

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

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

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	117035.6	117035.8	-	-	A	19-471	#1
11B	117489.5	117489.7	-	-	A		
12A	116889.1	116889.3	-	-	A	19-471	#2
12B	117941.5	117941.7	-	-	A		
13A	117455.8	117455.0	-	-	A	19-471	#3
13B	117054.9	117054.9	-	-	A		
14A	116818.0	116818.0	-	-	A	20-597	#1
14B	116771.9	116771.8	-	-	A		
15A	117418.0	117418.0	-	-	A	20-597	#2
15B	116904.9	116909.0	-	-	A		

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

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

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A	116537.5	116537.3	-	-	A	20-597	#3
16B	116034.1	116034.0	-	-	A		
17A	116810.5	116810.5	-	-	A	20-597	#4
17B	117139.0	117138.9	-	-	A		
18A	117406.9	117406.5	-	-	A	20-565	#1
18B	117320.6	117320.5	-	-	A		
19A	117025.3	117025.1	-	-	A	20-565	#2
19B	117011.0	117011.7	-	-	A		
20A	115625.7	115625.5	-	-	A	20-565	#3
20B	115964.0	115964.7	-	-	A		

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

Weight 2 Date/Time:
4/24 0830

Weight 3 Date/Time:

Weight 4 Date/Time:

15-W06

- I was using about 5 lbs of kinlin
 - I was using about 6 lbs of pretest
 - Test pieces are 18" Long
1. I am good with either way on the start up on this stove, either with both in the stove at the same time or separate, if you do both then of course the pretest on the bottom and kinlin on top, all that I ask is that the fire start from top down, split some really small pieces and lay a piece of paper on top with the small pieces and start the fire and then shut the door immediately with the damper fully open and blower on high (I will say I am more concerned with the high test then I was before just fyi, I don't have great equipment here though but the low and med have been doing awesome) then let it burn down till you are ready to load the test load and stack the best you can, you should be able to shut the door immediately after loading, just try to use wood that's between 18-22% if possible
 2. For the low test, chop the best you can and make sure the dog box isn't buried, load the test load and turn the blower on high and open the damper to fully open and shut the door immediately for 15 mins, then shut it down to fully closed
 3. Medium burn, chop the best you can, load the test load and shut the door immediately, damper should be halfway (should be marked with a red mark) and then after 15 mins turn blower on low
 4. Any questions feel free to ask or if something doesn't seem right or if you want to do the start up separate then I am fine with that, I lost the high test when I made the low/med better unless it's just these filters and my equipment as I said before, also if you feel that you need to increase the kinlin amount then that should be fine as well or the pretest, whatever helps, but sometimes its hard to get all the pieces in.

Sample Calculations – ASTM E3053 & E2515

Client: England's Stove Works
 Model: 15-W06
 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_{Fldb} – Weight of test fuel load, dry basis, lb (kg)

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

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

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

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

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

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

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

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

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

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

m_n – Total particulate matter collected, mg

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

E_T – Total particulate emissions, g

PR - Proportional rate variation

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

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

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

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

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

ASTM E3053 equation (1)

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

Where,

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

Sample Calculation:

n	M _{FLnwb}	MC _{FLn}	(M _{FLnwb})(100/(100 + MC _{FLn}))		
1	5.71	22.5	5.71 (100) / (100+ 22.5)) =	4.66	
2	5.59	18.7	5.59 (100) / (100+ 18.7)) =	4.71	
3	5.31	20.4	5.31 (100) / (100+ 20.4)) =	4.41	
4	8.88	18.9	8.88 (100) / (100+ 18.9)) =	7.47	
5	3.48	19.1	3.48 (100) / (100+ 19.1)) =	2.92	
6	4.47	21.5	4.47 (100) / (100+ 21.5)) =	3.68	
7	0.00		N/A	-	
			SUM	27.85	lbs
M _{Fldb} =	27.85	lbs			
M _{Fldb} =	12.63	kg			

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

ASTM E3053 equation (2)

$$M_{SUdb} = (M_{SUwb}) \left(\frac{100}{100 + MC_{SU}} \right)$$

Where,

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

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

Sample Calculation:

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

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

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

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

= **N/A** kg

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

ASTM E3053 equation (3)

$$M_{Kdb} = (M_{Kwb}) \left(\frac{100}{100 + MC_K} \right)$$

Where,

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

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

Sample calculation:

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

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

$$M_{Kdb} = N/A \left(\frac{100}{100 + N/A} \right)$$

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

= **N/A** kgs

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

ASTM E3053 equation (4)

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

Where,

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

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

Sample calculation:

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

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

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

$$M_{FREHdb} = \mathbf{N/A} \text{ lbs}$$

$$= \mathbf{N/A} \text{ kg}$$

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

ASTM E3053 equation (5)

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

Sample Calculation:

$$M_{Kdb} = N/A$$

$$M_{SUDb} = N/A$$

$$M_{FLdb} = N/A$$

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

$$M_{TFBHdb} = N/A + N/A + N/A - N/A$$

$$= \mathbf{N/A} \text{ lbs}$$

$$= \mathbf{N/A} \text{ kg}$$

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

ASTM E3053 equation (6)

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

Where,

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

Sample calculation:

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

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

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

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

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:

$$M_{FLdb} = 27.85$$

$$M_{FREdb} = 0.00$$

$$M_{TFBdb} = 27.85 - 0.00$$

$$= 27.85 \text{ lbs}$$

$$= 12.63 \text{ kg}$$

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,

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

Sample Calculation:

$$M_{TFBdb} = 27.85$$
$$\theta = 635$$

$$BR = \frac{60 \times 27.85}{635}$$

$$BR = 2.63 \text{ lb/hr}$$
$$= 1.19 \text{ kg/hr}$$

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
 ΔP^* = Velocity pressure in the dilution tunnel, in H₂O
 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. H₂O; (in Hg = in H₂O/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:

$$F_p = \frac{16.12}{18.81} = 0.857$$

$$V_s = 0.857 \times 85.49 \times 0.99 \times 0.285 \times \left(\frac{94.2 + 460}{\left(30.10 + \frac{-0.20}{13.6} \right) \times 28.78} \right)^{1/2}$$

$$V_s = \mathbf{16.57 \text{ ft/s}}$$

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

ASTM E2515 equation (3)

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

Where:

- 3600 = Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
- B_{ws} = Water vapor in gas stream, proportion by volume; assume 2%
- A = Cross sectional area of dilution tunnel, ft²
- T_{std} = Standard absolute temperature, 528 °R
- P_s = Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g, in Hg
- T_{s(avg)} = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
- P_{std} = Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 16.57 \times 0.1963 \times \frac{528}{94.2 + 460} \times \frac{30.10 + \frac{-0.20}{13.6}}{29.92}$$

Q_{sd} = **10992.1** dscf/hr

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

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

Where:

- K_1 = 17.64 °R/in. Hg
 V_m = Volume of gas sample measured at the dry gas meter, dcf
 Y = Dry gas meter calibration factor, dimensionless
 P_{bar} = Barometric pressure at the testing site, in. Hg
 ΔH = Average pressure differential across the orifice meter, in. H₂O
 T_m = Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 83.410 \times 1.012 \times \frac{(30.10 + \frac{1.70}{13.6})}{(101.5 + 460)}$$

$$V_{m(std)} = \mathbf{80.155} \text{ dscf}$$

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 79.860 \times 1.008 \times \frac{(30.10 + \frac{1.59}{13.6})}{(##### + 460)}$$

$$V_{m(std)} = \mathbf{76.139} \text{ dscf}$$

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 0.00 \times 0 \times \frac{(30.1 + \frac{0.00}{13.6})}{(74.5 + 460)}$$

$$V_{m(std)} = \mathbf{0} \text{ dscf}$$

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 (first hour):

$$m_n = 0.0 + 5.4 + 0.0$$

$$m_n = 5.4 \text{ mg}$$

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

$$m_n = 1.0 + 1.6 + 0.0$$

$$m_n = 2.6 \text{ mg}$$

Train A aggregate:

$$m_n = 5.4 + 2.6$$

$$m_n = \mathbf{8.0} \text{ mg}$$

Using equation for Train B:

$$m_n = 1.5 + 3.9 + 1.2$$

$$m_n = \mathbf{6.6} \text{ mg}$$

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

ASTM E2515 equation (13)

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

Where:

K₂ = Constant, 0.001 g/mgm_n = Total mass of particulate matter collected in the sampling train, mgV_{m(std)} = Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{8.0}{80.16}$$

$$C_s = \mathbf{0.00010} \text{ g/dscf}$$

For Train 2

$$C_s = 0.001 \times \frac{6.6}{76.14}$$

$$C_s = \mathbf{0.00009} \text{ g/dscf}$$

For Ambient Train

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

$$C_r = \mathbf{0} \text{ g/dscf}$$

E_T – Total Particulate Emissions, g

ASTM E2515 equation (15)

$$E_T = (C_s - C_r) \times Q_{std} \times \theta$$

Where:

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

Sample calculation:

For Train 1

$$E_T = (0.000100 - 0) \times 10992.1 \times 635 /60$$

$$E_T = \mathbf{11.61} \text{ g}$$

For Train 2

$$E_T = (0.000087 - 0) \times 10992.1 \times 635 /60$$

$$E_T = \mathbf{10.08} \text{ g}$$

Average

$$E = \mathbf{10.85} \text{ g}$$

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

$$7.5\% \text{ of the average} = 0.81$$

$$\text{Train 1 difference} = 0.76$$

$$\text{Train 2 difference} = 0.76$$

PR - Proportional Rate Variation

ASTM E2515 equation (16)

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

Where:

- θ = Total sampling time, min
- θ_i = Length of recording interval, min
- V_{mi} = Volume of gas sample measured by the dry gas meter during the "ith" time interval, dcf
- V_m = Volume of gas sample as measured by dry gas meter, dcf
- V_{si} = Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec
- V_s = Average gas velocity in the dilution tunnel, ft/sec
- T_{mi} = Absolute average dry gas meter temperature during the "ith" time interval, °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 1 minute interval of Train 1):

$$PR = \left(\frac{635 \times 0.121 \times 16.57 \times (129.0 + 460) \times (#### + 460)}{1 \times 83.41 \times 15.95 \times (94.2 + 460) \times (#### + 460)} \right) \times 100$$

PR = **102** %

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

ASTM E3053 equation (9)

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

Where,

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

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

Sample Calculation:

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

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

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

$$PM_{RH} = \mathbf{N/A} \text{ g/hr}$$

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

ASTM E3053 equation (10)

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

Sample Calculation:

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

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

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

$$= \mathbf{N/A} \text{ g/kg}$$

PM_R - Particulate emission rate for low or medium fire test runs, g/hr

ASTM E3053 equation (12)

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

Where,

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

Sample Calculation:

$$E_T = 10.85$$

$$\theta = 635$$

$$PM_R = 60(10.85 / 635)$$

$$PM_{RH} = 1.02 \text{ g/hr}$$

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

ASTM E3053 equation (13)

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

Sample Calculation:

$$E_T = 10.85$$

$$M_{TFBdb} = 12.63$$

$$PM_{FH} = 10.85 / 12.63$$
$$= 0.86 \text{ g/kg}$$

Sample Calculations – ASTM E3053 & E2515

Client: England's Stove Works
 Model: 15-W06
 Run: 1

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

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

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

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

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

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

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

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

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

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

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

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

m_n – Total particulate matter collected, mg

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

E_T – Total particulate emissions, g

PR - Proportional rate variation

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

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

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

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

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

ASTM E3053 equation (1)

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

Where,

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

Sample Calculation:

n	M _{FLnwb}	MC _{FLn}	(M _{FLnwb})(100/(100 + MC _{FLn}))	
1	5.49	21.8	5.49 (100) / (100+ 21.8)) =	4.51
2	4.84	22.6	4.84 (100) / (100+ 22.6)) =	3.95
3	5.63	22.2	5.63 (100) / (100+ 22.2)) =	4.61
4	4.36	20.6	4.36 (100) / (100+ 20.6)) =	3.62
5	6.93	19.6	6.93 (100) / (100+ 19.6)) =	5.79
6	0.00	NA	N/A	-
7	N/A	N/A	N/A	-
			SUM	22.47 lbs
M _{Fldb} =	22.47	lbs		
M _{Fldb} =	10.19	kg		

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

ASTM E3053 equation (2)

$$M_{SUdb} = (M_{SUwb}) \left(\frac{100}{100 + MC_{SU}} \right)$$

Where,

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

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

Sample Calculation:

$$M_{SUwb} = 6.63$$

$$MC_{SU} = 21.3$$

$$M_{SUdb} = 6.6 \left(\frac{100}{100 + 21.3} \right)$$

$$M_{SUdb} = \mathbf{5.47} \text{ lbs}$$

$$= \mathbf{2.48} \text{ kg}$$

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

ASTM E3053 equation (3)

$$M_{Kdb} = (M_{Kwb}) \left(\frac{100}{100 + MC_K} \right)$$

Where,

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

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

Sample calculation:

$$M_{Kwb} = 4.86$$

$$MC_K = 10.0$$

$$M_{Kdb} = 4.86 \left(\frac{100}{100 + 10.0} \right)$$

$$M_{Kdb} = \mathbf{4.42} \text{ lbs}$$

$$= \mathbf{2.00} \text{ kgs}$$

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

ASTM E3053 equation (4)

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

Where,

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

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

Sample calculation:

$$M_{RSUBdb} = 3.4$$

$$M_{FLEHdb} = 2.7$$

$$M_{FREHdb} = 3.40 + 2.7$$

$$M_{FREHdb} = \mathbf{6.10} \text{ lbs}$$

$$= \mathbf{2.77} \text{ kg}$$

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

ASTM E3053 equation (5)

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

Sample Calculation:

$$M_{Kdb} = 4.42$$

$$M_{SUdb} = 5.47$$

$$M_{FLdb} = 22.47$$

$$M_{FREHdb} = 6.10$$

$$M_{TFBHdb} = 4.42 + 5.47 + 22.47 - 6.10$$

$$= \mathbf{26.26} \text{ lbs}$$

$$= \mathbf{11.91} \text{ kg}$$

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

ASTM E3053 equation (6)

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

Where,

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

Sample calculation:

$$\begin{aligned} M_{FLdb} &= 22.47 \\ M_{FLEHdb} &= 2.70 \\ \theta_{H1} &= 107 \end{aligned}$$

$$BR_H = \frac{60 (22.47 - 2.70)}{107}$$

$$\begin{aligned} BR_H &= \mathbf{11.09} \text{ lb/hr} \\ &= \mathbf{5.03} \text{ kg/hr} \end{aligned}$$

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,

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

Sample Calculation:

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

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

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

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
 ΔP^* = Velocity pressure in the dilution tunnel, in H₂O
 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. H₂O; (in Hg = in H₂O/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:

$$F_p = \frac{16.13}{18.82} = 0.857$$

$$V_s = 0.857 \times 85.49 \times 0.99 \times 0.286 \times \left(\frac{139.5 + 460}{\left(30.03 + \frac{-0.20}{13.6} \right) \times 28.78} \right)^{1/2}$$

$$V_s = \mathbf{17.27 \text{ ft/s}}$$

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

ASTM E2515 equation (3)

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

Where:

- 3600 = Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
- B_{ws} = Water vapor in gas stream, proportion by volume; assume 2%
- A = Cross sectional area of dilution tunnel, ft²
- T_{std} = Standard absolute temperature, 528 °R
- P_s = Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g, in Hg
- T_{s(avg)} = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
- P_{std} = Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 17.27 \times 0.1963 \times \frac{528}{139.5 + 460} \times \frac{30.03 + \frac{-0.20}{13.6}}{29.92}$$

Q_{sd} = **10567.4** dscf/hr

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

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

Where:

- K_1 = 17.64 °R/in. Hg
 V_m = Volume of gas sample measured at the dry gas meter, dcf
 Y = Dry gas meter calibration factor, dimensionless
 P_{bar} = Barometric pressure at the testing site, in. Hg
 ΔH = Average pressure differential across the orifice meter, in. H₂O
 T_m = Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 18.501 \times 1.012 \times \frac{(30.03 + \frac{1.68}{13.6})}{(91.5 + 460)}$$

$$V_{m(std)} = \mathbf{18.058} \text{ dscf}$$

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 18.411 \times 1.008 \times \frac{(30.03 + \frac{1.68}{13.6})}{(92.3 + 460)}$$

$$V_{m(std)} = \mathbf{17.873} \text{ dscf}$$

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 0.00 \times 0 \times \frac{(30.03 + \frac{0.00}{13.6})}{(75.7 + 460)}$$

$$V_{m(std)} = \mathbf{0} \text{ dscf}$$

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 (first hour):

$$m_n = 0.0 + 3.3 + 0.0$$

$$m_n = 3.3 \text{ mg}$$

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

$$m_n = 1.5 + 1.5 + 0.0$$

$$m_n = 3.0 \text{ mg}$$

Train A aggregate:

$$m_n = 3.3 + 3.0$$

$$m_n = \mathbf{6.3} \text{ mg}$$

Using equation for Train B:

$$m_n = 2 + 2.3 + 1.7$$

$$m_n = \mathbf{6.0} \text{ mg}$$

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

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

Where:

- K₂ = Constant, 0.001 g/mg
- m_n = Total mass of particulate matter collected in the sampling train, mg
- V_{m(std)} = Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{6.3}{18.06}$$

$$C_s = \mathbf{0.00035} \text{ g/dscf}$$

For Train 2

$$C_s = 0.001 \times \frac{6.0}{17.87}$$

$$C_s = \mathbf{0.00034} \text{ g/dscf}$$

For Ambient Train

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

$$C_r = \mathbf{0} \text{ g/dscf}$$

E_T – Total Particulate Emissions, g

ASTM E2515 equation (15)

$$E_T = (C_s - C_r) \times Q_{std} \times \theta$$

Where:

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

Sample calculation:

For Train 1

$$E_T = (0.000349 - 0) \times 10567.4 \times 144 /60$$

$$E_T = \mathbf{8.85} \text{ g}$$

For Train 2

$$E_T = (0.000336 - 0) \times 10567.4 \times 144 /60$$

$$E_T = \mathbf{8.51} \text{ g}$$

Average

$$E = \mathbf{8.68} \text{ g}$$

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

$$7.5\% \text{ of the average} = 0.65$$

$$\text{Train 1 difference} = 0.17$$

$$\text{Train 2 difference} = 0.17$$

PR - Proportional Rate Variation

ASTM E2515 equation (16)

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

Where:

- θ = Total sampling time, min
- θ_i = Length of recording interval, min
- V_{mi} = Volume of gas sample measured by the dry gas meter during the "ith" time interval, dcf
- V_m = Volume of gas sample as measured by dry gas meter, dcf
- V_{si} = Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec
- V_s = Average gas velocity in the dilution tunnel, ft/sec
- T_{mi} = Absolute average dry gas meter temperature during the "ith" time interval, °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 1 minute interval of Train 1):

$$PR = \left(\frac{144 \times 0.088 \times 17.27 \times (82.0 + 460) \times (91.5 + 460)}{1 \times 18.501 \times 15.95 \times (139.5 + 460) \times (77.0 + 460)} \right) \times 100$$

PR = **69** %

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

ASTM E3053 equation (9)

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

Where,

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

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

Sample Calculation:

$$E_{TH} = 8.68$$

$$\theta_{H2} = 144$$

$$PM_{RH} = 60(8.68 / 144)$$

$$PM_{RH} = 3.62 \text{ g/hr}$$

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

ASTM E3053 equation (10)

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

Sample Calculation:

$$E_{TH} = 8.68$$

$$M_{TFBHdb} = 11.91$$

$$PM_{FH} = 8.68 / 11.91$$

$$= 0.73 \text{ g/kg}$$

PM_R - Particulate emission rate for low or medium fire test runs, g/hr

ASTM E3053 equation (12)

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

Where,

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

Sample Calculation:

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

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

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

$$PM_{RH} = N/A \text{ g/hr}$$

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

ASTM E3053 equation (13)

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

Sample Calculation:

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

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

$$PM_{FH} = N/A / N/A$$
$$= N/A \text{ g/kg}$$



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

FEB 28 2018

Mr. Justin White
Hearthstone QHPP, Inc.
#17 Stafford Ave.
Morrisville, VT 05661

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Dear Mr. White,

I am writing in response to your letter dated January 12, 2018, regarding wood heaters manufactured by Hearthstone QHPP, Inc. (Hearthstone). This response, dated February 28, 2018, supercedes our previous response (dated February 26, 2018) to correct an inaccuracy regarding required changes to ASTM E3053-17.

You are requesting to use an alternative test method, using cord wood, as referenced in section 60.532(c) of 40 CFR part 60, Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA) to meet the 2020 cord wood alternative compliance option. The 2020 cord wood alternative compliance option states that each affected wood heater manufactured or sold at retail for use in the United States on or after May 15, 2020, must not discharge into the atmosphere any gases that contain particulate matter in excess of 2.5 g/hr. Compliance must be determined by a cord wood test method approved by the Administrator along with the procedures in 40 CFR 60.534. You have requested approval to use the procedures and specifications found in ASTM Method E3053-17, a cord wood test method titled, "Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel," in conjunction with ASTM E2515-11 and Canadian Standards Administration (CSA) Method CSA-B415.1-10, which are specified in 40 CFR 60.534.

We understand that Hearthstone is also requesting that the alternative method proposed above be approved to apply broadly to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA, from the approval date of this request until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, providing all requirements of section 60.533 of Subpart AAA are met.

With the caveats set forth below, we approve your alternative test method request for certifying wood heaters using ASTM E3053-17 in conjunction with section 60.534 of Subpart AAA to meet the 2020 cord wood compliance option until such time that Subpart AAA is revised or replaced to require a different cord wood certification method. We also approve application of this alternative method to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA.

As required in Subpart AAA, section 60.354(d), you or your approved test laboratory must also measure the first hour of particulate matter emissions for each test run using a separate filter in one of the two parallel sampling trains. These results must be reported separately and also included in the total particulate matter emissions per run. Also, as required by Subpart AAA, section 60.534(e), you must have your approved laboratory measure the efficiency, heat output, and carbon monoxide emissions of the tested wood heater using CSA-B415.1-10. For measurement of particulate matter emission concentrations, ASTM 2515-11 must be used.

The following change to ASTM E3053-17 must be followed:

1. 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.

The following changes to ASTM E2515-11 must be followed:

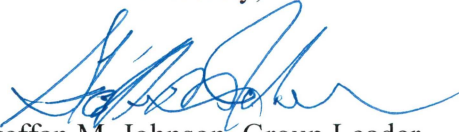
1. The filter temperature must be maintained between 80 and 90 degrees F during testing.
2. Filters must be weighed in pairs to reduce weighing error propagation; see ASTM 2515-11, Section 10.2.1 Analytical Procedure.
3. Sample filters must be Pall TX-40 or equivalent Teflon-coated glass fiber, and of 47 mm, 90 mm, 100 mm, or 110 mm in diameter.
4. Only one point is allowed outside the +/- 10 percent proportionality range per test run.

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

It is reasonable that this alternative test method approval be broadly applicable to all wood heaters subject to the requirements of 40 CFR part 60, Subpart AAA. For this reason, we will post this letter as ALT-125 on our website at <http://www3.epa.gov/ttn/emc/approalt.html> for use by other interested parties. As noted earlier in this letter, this alternative method approval is valid until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, and at such time, this alternative will be reconsidered and possibly withdrawn.

If you have additional questions regarding this approval, please contact Michael Toney of my staff at 919-541-5247 or toney.mike@epa.gov.

Sincerely,



Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Amanda Aldridge, EPA/OAQPS/OID
Adam Baumgart-Getz, EPA/OAQPS/OID
Rafael Sanchez, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD



Model 15-W08 50-SHW08 50-TRW08

Solid Fuel Burning Room Heater; Free Standing Model "SUITABLE FOR MOBILE-HOME INSTALLATION"

Certified to UL-1482 & ULC-627-00, EPA METHOD 28R, ASTM E3053-17, EPA Alt 125, CSA B415.1-10

W/N#

SERIAL NO.	<input type="text"/>
MFG. DATE	<input type="text"/>

Manufactured by:
England's Stove Works, Inc.
589 S. Five Forks Rd.
Monroe, VA 24574

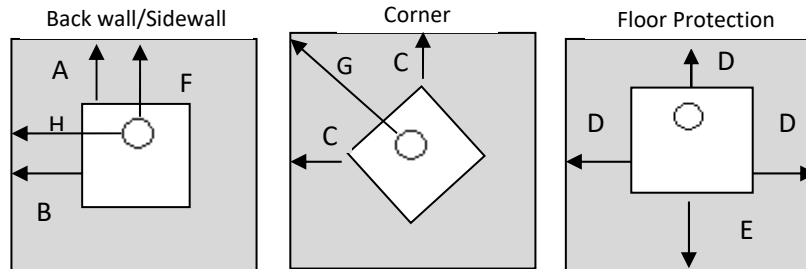
DO NOT REMOVE OR COVER THIS LABEL

- PREVENT HOUSE FIRES – INSTALL AND USE ONLY IN ACCORDANCE WITH THE OWNER’S MANUAL PROVIDED WITH THIS APPLIANCE.
- CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.

INSTALLATION REQUIREMENTS

- DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.
- USE A RESIDENTIAL TYPE MASONRY OR FACTORY BUILT CHIMNEY LISTED TO UL-103 HT (US) AND ULC-629 (CANADA).
- USE 24 GAUGE MSG BLACK SINGLE WALL CHIMNEY CONNECTOR OR LISTED DOUBLE WALL CHIMNEY CONNECTOR.
- REFER TO LOCAL CODES AND THE CHIMNEY MANUFACTURER’S INSTRUCTIONS FOR PRECAUTIONS REQUIRED FOR PASSING A CHIMNEY THROUGH A COMBUSTIBLE WALL OR CEILING.
- FOR THE US: PLACE ON A NON-COMBUSTIBLE TYPE FLOOR PROTECTOR WITH A R VALUE OF AT LEAST , WHICH EXTENDS IN. TO THE FRONT AND IN. TO EACH SIDE OF THE FUEL LOADING OPENING.
- FOR CANADA: PLACE ON A NON-COMBUSTIBLE TYPE FLOOR PROTECTOR WITH A R FACTOR OF AT LEAST , WHICH EXTENDS MM. TO THE FRONT AND MM. TO EACH SIDE OF THE FUEL LOADING OPENING.
- ADHERE TO THE LISTED MINIMUM CLEARANCES TO COMBUSTIBLES WHEN USING SINGLE WALL CHIMNEY CONNECTOR. SEE THE OWNER’S MANUAL FOR ADDITIONAL CLEARANCE INFORMATION.
- ONLY OPERATE THIS UNIT WITH THE DOOR CLOSED AND LATCHED TIGHTLY.
- THE MAIN LOADING DOOR CONTAINS A CERAMIC VIEWING WINDOW; DO NOT SLAM THE DOOR OR STRIKE THIS VIEWING WINDOW AT ANY TIME.
- IF THE GLASS IS CRACKED OR BROKEN, REPLACE WITH CERAMIC GLASS ONLY.
- EMISSION VALUE – 1.8 GRAMS/HR
- U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CORD WOOD.
- OPTIONAL PART- BLOWER PART NUMBER AC-30 (FASCO) ELECTRICAL RATING 115 V, 60 HZ., 0.8 A
- REFER TO PFS TECO’S DIRECTORY OF BUILDING PRODUCTS ([HTTP://WWW.PFSTECO.COM/BUILDING-PRODUCTS](http://www.pfsteco.com/building-products)) FOR DETAILED INFORMATION.

OPERATION REQUIREMENTS: FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT OVER-FIRE, IF HEATER OR CHIMNEY CONNECTOR GLOWS YOU ARE OVER-FIRING. INSPECT AND CLEAN CHIMNEY FREQUENTLY, UNDER CERTAIN CONDITIONS OF USE, CREOSOTE BUILDUP MAY OCCUR RAPIDLY. DO NOT USE A GRATE OR ELEVATE THE FIRE, BURN WOOD FIRE DIRECTLY ON THE HEARTH. RISK OF SMOKE AND FLAME SPILLAGE, OPERATE ONLY WITH DOOR FULLY CLOSED. This wood heater needs periodic inspection and repair for proper operation. Consult the owner’s manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner’s manual.



A = inches (mm) B = inches (mm) C = inches (mm)
D = inches (mm) E = inches (mm) F = inches (mm)
G = inches (mm) H = inches (mm)



CAUTION - HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING, AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. SEE NAMEPLATE AND INSTRUCTIONS.



15-W08, 50-SHW08, 50-TRW08
INSTALLATION & OPERATION MANUAL



www.heatredefined.com
Parts (800) 516-3636
Questions (800) 245-6489



Rev 5/2020

Manufactured By: England's Stove Works, Inc. PO Box 206 Monroe, VA 24574

CAUTION

Please read this entire manual before installation and use of this wood fuel- burning appliance. Keep children, furniture, fixtures and all combustibles away from any heating appliance.

SAVE THESE INSTRUCTIONS

SAFETY NOTICE

Failure to follow these instructions can result in property damage, bodily injury or even death. For your safety and protection, follow the installation instructions outlined in this manual. Contact your local building or fire officials about restrictions and installation inspection requirements (including permits) in your area.

THIS WOOD HEATER NEEDS PERIODIC INSPECTION AND REPAIR FOR PROPER OPERATION. CONSULT THE OWNER'S MANUAL FOR FURTHER INFORMATION. IT IS AGAINST FEDERAL REGULATIONS TO OPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITH THE OPERATING INSTRUCTIONS IN THE OWNER'S MANUAL.

IMPORTANT: IF YOU HAVE A PROBLEM WITH THIS UNIT, DO NOT RETURN IT TO THE DEALER. CONTACT TECHNICAL SUPPORT @ 1-800-245-6489

Mobile Home Use:

This freestanding wood unit is approved for mobile home or doublewide installation with the outside combustion air hook-up. See the "Installation" section of this manual for details pertaining to mobile home installations. Mobile home installation must be in accordance with the Manufactured Home and Safety Standard (HUD), CFR 3280, Part 24.

Retain for your files

Model Number _____

Date of Purchase _____

Date of Manufacture _____

Serial Number _____

* This information can be found on the safety tag attached to the rear of the unit. Have this information on hand if you phone the factory or your dealer regarding this product.

CAUTION

- Keep children away.
- Supervise children in the same room as this appliance.
- Alert children and adults to the hazards of high temperatures.
- Do NOT operate with protective barriers open or removed.
- Hot while in operation! Keep clothing, furniture, draperies and other combustibles away. Contact may cause skin burns!
- **Do NOT over-fire your unit.**
- Installation MUST comply with local, regional, state and national codes and regulations.
- Consult local building, fire officials or authorities having jurisdiction about restrictions, installation inspection, and permits.

WELCOME!

Introduction

- Thank You 4

Specifications

- Heating Specifications..... 5
- Dimensions..... 5
- EPA Compliance 5

Installation

- Installation Overview 6
- Clearances to Combustibles..... 7
- Venting Introduction..... 8
- Venting Guidelines..... 8
- Additional Venting Information ... 9
- Wall Pass-Throughs..... 10
- Approved Venting Methods
 - Through the Wall 11
 - Through the Ceiling..... 12
 - Masonry Chimney..... 13
 - Masonry Fireplace..... 14
- Mobile Home Installation 15
- Outside Air Hook-Up 15
- Floor Protection 16

Operation

- Break-In Fires 17
- Continuous Operation..... 17-18
- Safety Notes 19-20

Maintenance

- Stove Maintenance 21

- Inspecting Gaskets..... 22
- Finish 22

Replacing Components

- Glass and Insert..... 23
- Burner Tubes 24
- Ceramic Fiberboard..... 24
- Heat Shield 24
- Blower 25

Optional Accessories

- AC-16/AC-30 Blower 25

Important Information

- EPA and Safety Info 26

Troubleshooting Guide

- Troubleshooting..... 31

Illustrated Parts Detail

- Parts List..... 32
- Brick Layout 33

Warranty

- Sample Tag..... 34
- Warranty Details 35
- Important Notice 36
- Warranty registration Form 37

IMPORTANT NOTES: CLEARANCES MAY ONLY BE REDUCED BY MEANS APPROVED BY THE REGULATORY AUTHORITY HAVING JURISDICTION

DO NOT CONNECT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTHA OR ENGINE OIL. DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.

INTRODUCTION

Thank you for purchasing this fine product from England's Stove Works! England's Stove Works was started, and is still owned by, a family that believes strongly in a "Do It Yourself" spirit; that's one reason you found this product at your favorite "Do It Yourself" store.

We intentionally design and build our stoves so that any homeowner can maintain their unit with basic tools, and we're always more than happy to show you how to do the job as easily and as inexpensively as possible. However, while remaining simple, our stoves are designed to perform extremely efficiently, helping deliver more heat from less fuel.

Please look at our vast Help section on our website and call our Technical Support Department at (800) 245-6489 if you need any help with your unit. We are nearly always able to "walk you through" any installation issues, repairs, problems or other questions that you may have.

Wishing you years of efficient, quality and "comfy" heating,

EVERYONE AT ENGLAND'S STOVE WORKS

Please Note: While information obtained from our web site and through our Technical Support line is always free of charge, there will be a service charge incurred with any "on-site" repairs or maintenance that we may arrange.

This manual is available for free download on the manufacturer's web site. It is a copyrighted document and resale is strictly prohibited. The manufacturer may update this manual occasionally and cannot be responsible for problems including injuries or damages resulting from the use of information found in any manual from unauthorized sources.
PLEASE NOTE: If you purchased this model from certain stores, their model number may end in "L" "LC" "H" "CT", etc. This manual does apply to those models as well.

CAUTION: Stove is heavy.

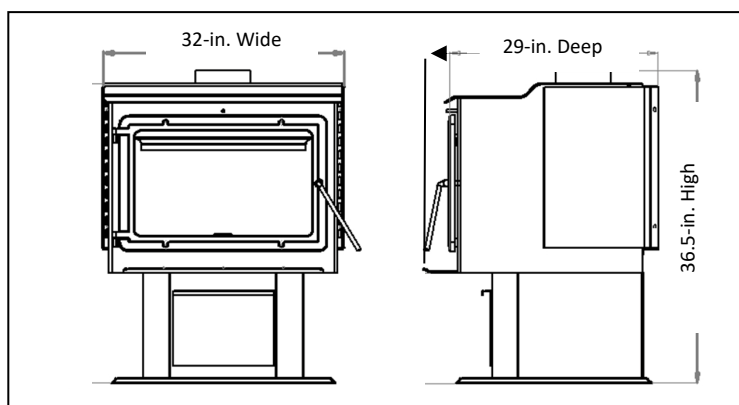
In addition, when handling any sheet metal products, be aware that there may be sharp edges or burrs. Although we make every effort to eliminate any sharp edges, please use caution when handling any metal parts. Remember to disconnect (unplug) the stove from the power source and allow it to completely cool down before performing any maintenance.

SPECIFICATIONS

Heating Specifications

- Maximum Burn Time** Up to 14 hours
- Approximate Square Footage Heated*** 2,400 sq. ft.
- Flue Collar 6.0 in. round

Dimensions (Inches)



EPA and Safety Compliance Specifications

- **EPA Compliance Status** Certified to comply with 2020 particulate emission standards using cord wood.
- U.S. Test Standard: US EPA 40 CFR Part 60, Subpart 60.536
- Particulate Emissions 1.8 grams/hr
- CO Emissions 1.9 grams/min
- Heat Output Range 17500 – 65900 Btu/hr
- Efficiency* 72% HHV
- Tested To EPA Test Method 28R, ASTM E3053-17, EPA Alt 125, CSA B415.1-10

Dimensions are approximate. Be sure to locate your stove in the installation area before installing pipe, etc.

** - Maximum burn times are heavily dependent on the type of wood burned in the stove; as such, these numbers may vary.

*** - The maximum heating capacity of this unit can vary greatly based on climate, construction style, insulation and a myriad of other factors. Use this information in conjunction with a BTU loss calculation for your home to determine if this unit will be sufficient for your needs.

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

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

INSTALLATION

Installation Overview

When choosing a location for your new stove, there are a multitude of factors that should be taken into account before beginning the installation.

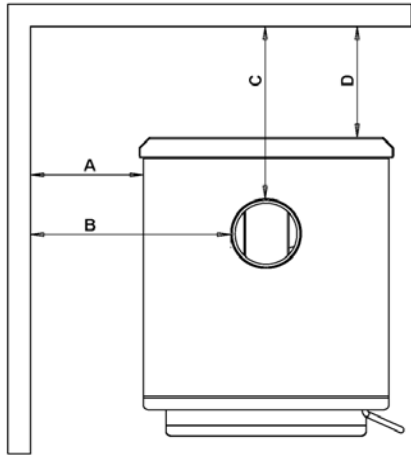
1. Traffic Patterns – To help prevent accidents, the stove should be placed in a location where it is out of the way of normal travel through the home.
2. Heat Flow and Efficiency – When deciding on a location for the stove, consider the way heat moves throughout your home. Install the stove where you need the heat; basement installations often do not allow sufficient heat to flow to the upper floors and a top floor installation will not allow any heat to reach the floors below. Always consider that heat rises and will take the path of least resistance while it is still hot.
3. Exhaust Location – The engine which drives a wood stove is the chimney system, so it is important to consider precisely how the chimney system will be integrated into the stove installation. Ideally, a wood stove chimney will run completely vertical from the flue collar of the unit all the way to the termination point above the roof line. Keeping the entire chimney system inside the heated envelope of the home will ensure a strong, easy to initiate draft in the chimney. Although exterior chimney systems often function properly, they are more likely to suffer from cold down drafts at start up or provide weak draft to the unit. Also, consider the cross-sectional area of the chimney; although existing masonry chimneys can often be used, a large external masonry chimney will result in a unit that is difficult or impossible to operate properly. In that case, an insulated chimney liner will often be required to supply the necessary draft.
4. Wall Construction – Locating the stove so that the exhaust system can pass between studs will simplify the installation and eliminate the need to reframe any sections of the wall or ceiling to accommodate the wall thimble or ceiling box.

WARNING

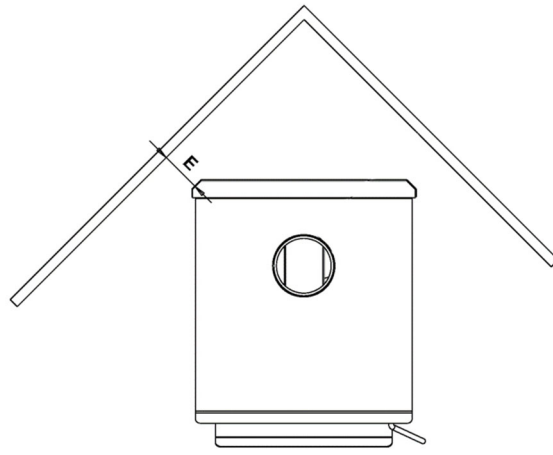
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do Not Over-fire – If any external part starts to glow, you are over-firing. Reduce intake air supply. Over-firing will void your warranty.
- Comply with all minimum clearances to combustibles as specified. Failure to comply may result in a house fire.
- Tested and approved for **cordwood only**. Burning any other fuel will void your warranty.

INSTALLATION

Clearances to Combustibles



*Parallel
Wall Installation*



Corner Installation

WARNING - INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER

	Unit to Side Wall *	Chimney Connector to Side Wall	Chimney Connector to Rear Wall	Unit to Rear Wall	Unit to Corner	Chimney Connector to Corner
	A	B	C	D	E	F
	in. (mm.)	in. (mm.)	in. (mm.)	in. (mm.)	in. (mm.)	in. (mm.)
Single Wall Chimney Connector Unprotected Surface	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Double Wall Chimney Connector Unprotected Surface	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Single Wall Chimney Connector Unprotected Surface with side shields.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Double Wall Chimney Connector Unprotected Surface with side shields.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Notes for this unit: The product may differ slightly from the diagrams. The clearances are the minimum for this unit and may need to be increased to have proper ventilation clearances. Observe all ventilation manufacturer clearances and local codes.

INSTALLATION

Venting Introduction

This wood stove operates on a natural draft system, in which the chimney system pulls air through the stove. This unit must be installed in accordance with the following detailed descriptions of venting techniques; not installing the stove in accordance with the details listed here can result in poor stove performance, property damage, bodily injury or death. Avoid make-shift compromises when installing the venting system. England's Stove Works is not responsible for any damage incurred due to a poor or unsafe installation.

Be certain that all aspects of the venting system are installed to the venting manufacturer's instructions, particularly the required clearances to combustibles. Also, be certain to use an attic radiation shield to prevent insulation from contacting a chimney which passes through an attic.

The chimney system is the "engine" which drives a wood stove, so it is imperative for proper unit function that the venting system be installed exactly as described in the following section.

If questions arise pertaining to the safe installation of the stove, our Technical Support line (800-245-6489) is available. Contact your local code official to be certain your installation meets local and national fire codes, and if you're uncertain about how to safely install the stove, we strongly recommend contacting a local NFI certified installer to perform the installation.

Venting Guidelines

- **ALWAYS** install vent pipe in strict adherence to the instructions and clearances included with your venting system.
- **DO NOT** connect this wood stove to a chimney flue which also serves another appliance.
- **DO NOT** install a flue pipe damper or any other restrictive device in the exhaust venting system of this unit.
- **USE** an approved wall thimble when passing and a ceiling support/fire stop when passing through a ceiling.
- **INSTALL** three sheet metal screws at every chimney connector joint.
- **AVOID** excessive horizontal runs and elbows, as both will reduce the draft of the venting system and will result in poor stove performance.
- **INSPECT** your venting system often, to be certain it is clear of creosote, fly-ash and other restrictions.
- **CLEAN** the venting system as detailed in the maintenance section of this manual.
- **ADHERE** to the 10-3-2 rule regarding chimney terminations.
- **INSTALL** single wall chimney connector with the male end **down** to prevent creosote leakage. Follow double wall chimney connector manufacturer's instructions regarding proper pipe installation.

Where passage through a wall or partition of combustible construction is desired, the installation shall conform with CAN/CSA-B365.

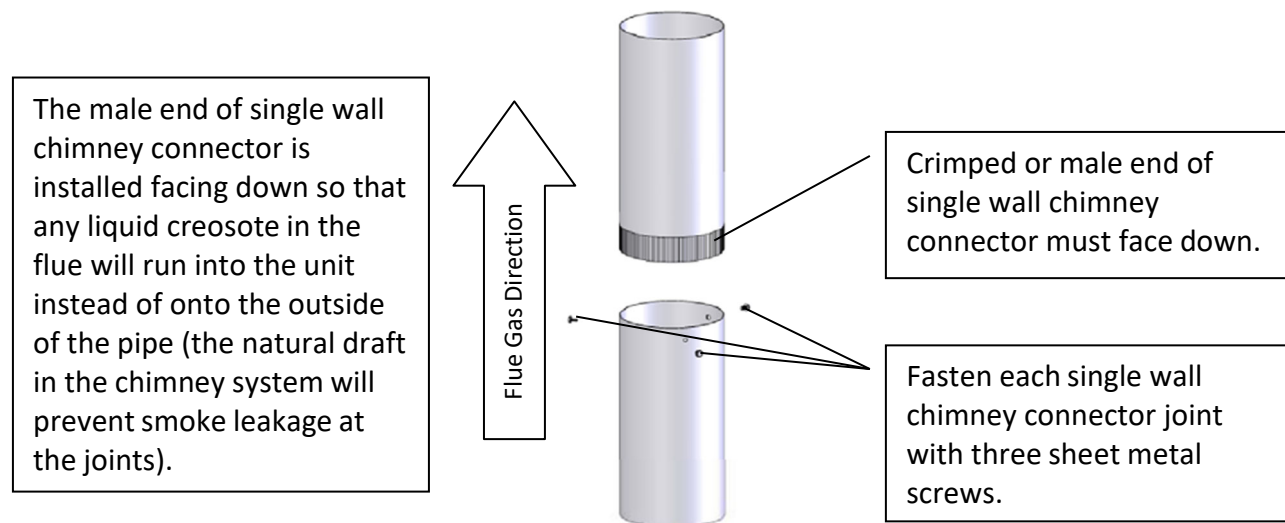
WARNING: Venting system surfaces get HOT, and can cause burns if touched. Noncombustible shielding or guards may be required.

INSTALLATION

Additional Venting Information

- Do not mix and match components from different pipe manufacturers when assembling your venting system (i.e. Do **NOT** use venting pipe from one manufacturer and a thimble from another).
- We **require** a minimum chimney height of 15.0 ft. Chimney systems shorter than this may not create the amount of draft which is required to operate this wood burning unit.
- Do not use makeshift compromises when installing the venting system; have existing chimney systems inspected before use and be certain all new chimney systems are installed to the manufacturer's specifications and with only UL listed components (ULC if Canada).
- Prefabricated venting systems used for this stove must be listed to ULC S629 (Canada) and UL 103HT (US).
- Never install a draft inducer or any other system which increases the natural draft of the chimney; similarly, do not install a barometric or stovepipe damper with this unit.
- Never use single wall or double chimney connector as a chimney system; never pass either type of chimney connector through a combustible wall without carefully following the manufacturer's instructions and those listed in the following page on Wall Pass-Throughs. NEVER pass chimney connector through an attic, floor, closet or roof.
- Only use 24 gauge MSG black single wall chimney connector or UL Listed (ULC if Canada) double wall chimney connector.

Single Wall Chimney Connector Installation



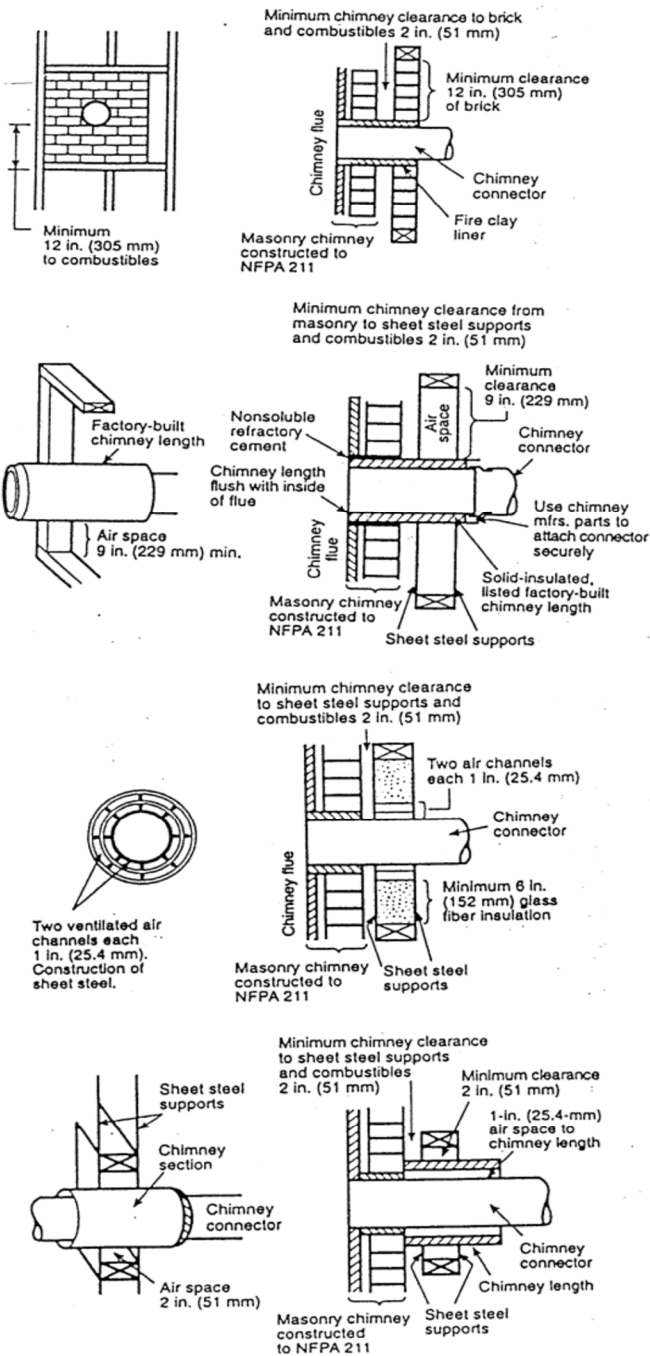
WARNING

- INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.
- HOT! Do not touch! Severe burns or clothing ignition may result.
- Glass and other surfaces are hot during operation.

INSTALLATION

Wall Pass-Throughs

Chimney Connector Systems and Clearances from Combustible Walls for Residential Heating Appliances



A Minimum 3.5-in thick brick masonry all framed into combustible wall with a minimum of 12-in brick separation from clay liner to combustibles. The fireclay liner shall run from outer surface of brick wall to, but not beyond, the inner surface of chimney flue liner and shall be firmly cemented in place.

B Solid-insulated, listed factory-built chimney length of the same inside diameter as the chimney connector and having 1-in. or more of insulation with a minimum 9-in. air space between the outer wall of the chimney length and combustibles.

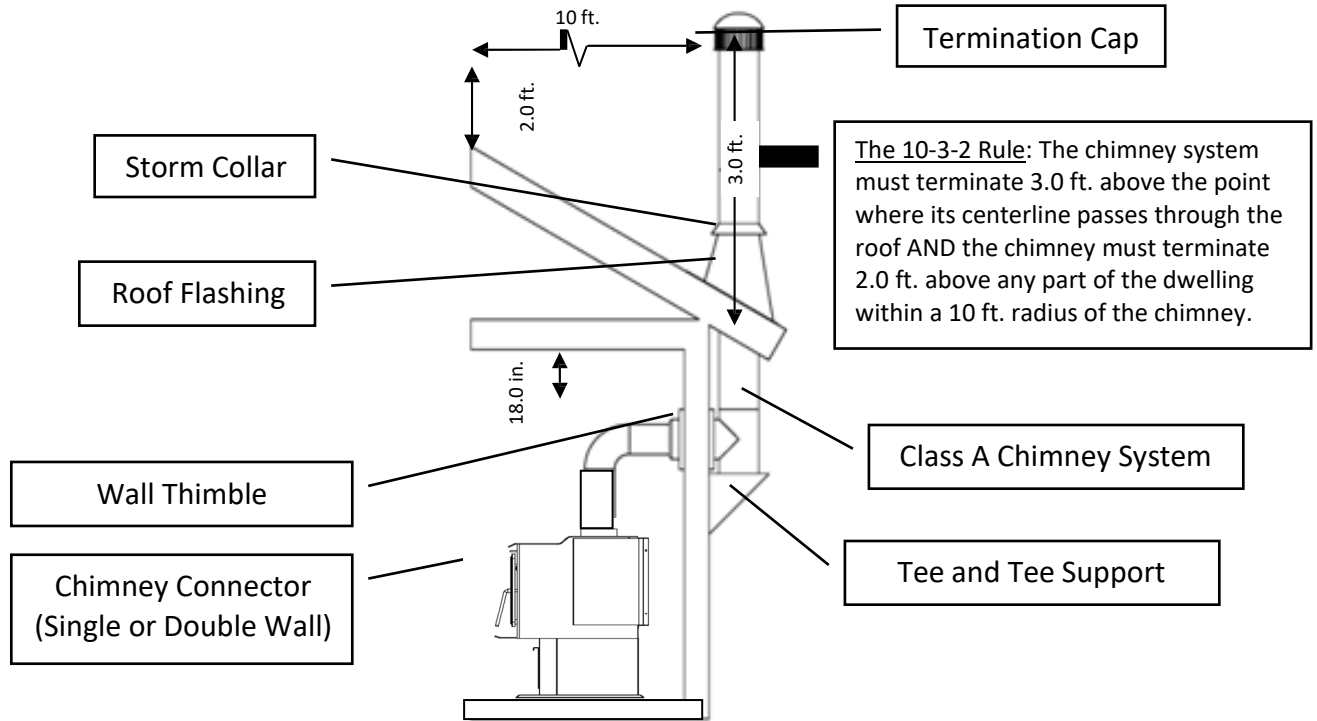
C Sheet steel chimney connector, minimum 24 gauge in thickness, with a ventilated thimble, minimum 24 gauge in thickness, having two 1-in. air channels, separated from combustibles by a minimum of 6-in. of glass fiber insulation. Opening shall be covered, and thimble supported with a sheet steel support, minimum 24 gauge in thickness.

D Solid insulated, listed factory-built chimney length with an inside diameter 2-in. larger than the chimney connector and having 1-in. or more of insulation, serving as a pass-through for a single wall sheet steel chimney connector of minimum 24 gauge thickness, with a minimum 2-in. air space between the outer wall of chimney section and combustibles. Minimum length of chimney section shall be 12-in. chimney section spaced 1-in. away from connector using sheet steel support plates on both ends of chimney section. Opening shall be covered, and chimney section supported on both sides with sheet steel supports securely fastened to wall surfaces of minimum 24 gauge thickness. Fasteners used to secure chimney section shall not penetrate chimney flue liner.

In Canada, the installation must conform to CAN/CSA-8365 when passing through combustible construction.

INSTALLATION

Approved Venting Method 1: Through the Wall Factory Built Chimney

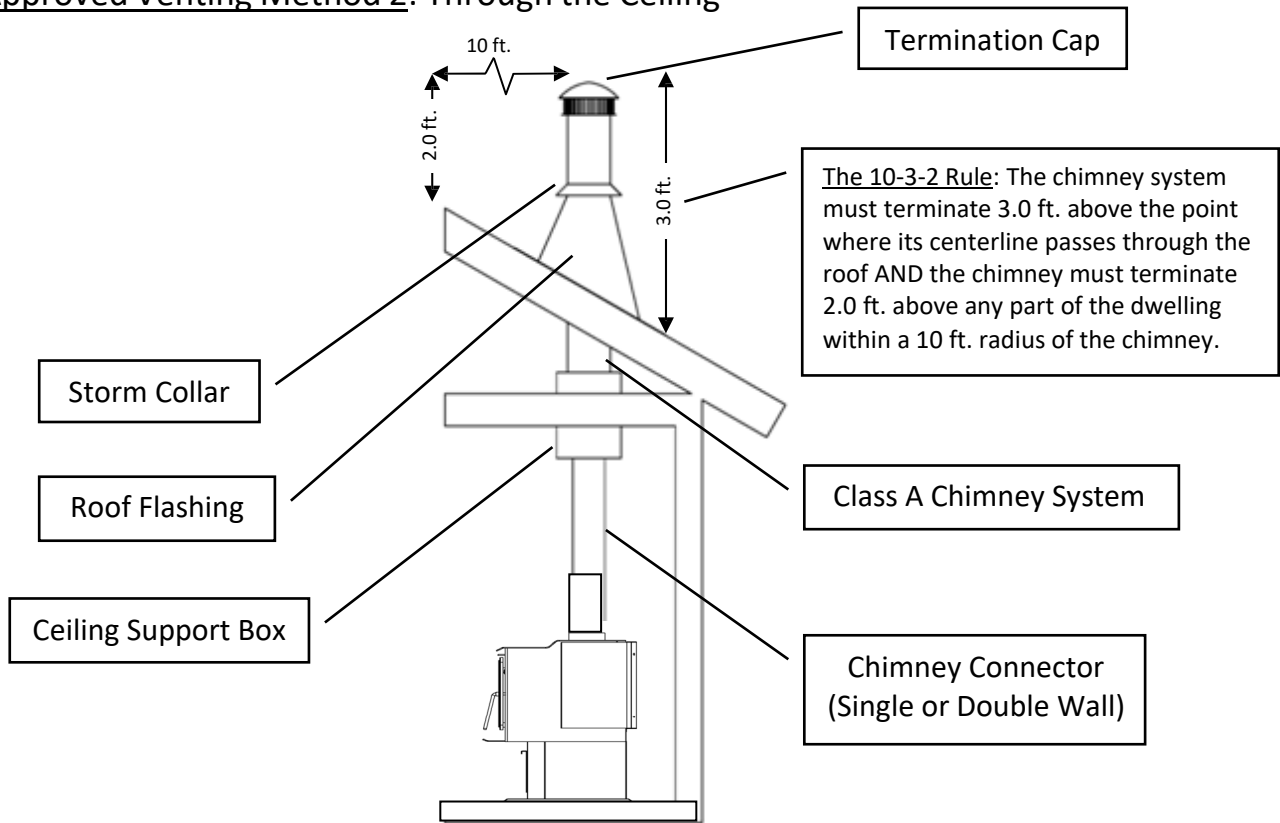


- Prefabricated chimney systems must conform to UL-103HT (2100 °F) for the U.S. and ULC-S629 (650°C) for Canada.
- This wood burning unit is only listed for installation with 6.0" diameter chimney connector and chimney systems. Installing this unit on prefabricated chimneys larger than 6.0" diameter will result in decreased draft and the potential for poor unit performance.
- Follow all venting system manufacturer's installation requirements and required clearances.
- Use three sheet metal screws at each single wall chimney connector joint (check manufacturer's recommendations when double wall chimney connector is used).
- Drill three holes in the flue collar of the unit and attach the chimney connector to the unit using sheet metal screws (holes should be pre-drilled in flue collar from factory).
- Properly attach the prefabricated chimney system to the home in strict accordance with the prefabricated chimney system manufacturer's instructions.
- Avoid numerous elbows and excessive horizontal runs as both will lead to poor draft and increased creosote accumulation. Horizontal runs of chimney connector must never exceed 4.0 ft. and the overall length of the chimney connector must not exceed 8.0 ft.
- Special adapters and slip connectors are available to eliminate the need to cut single wall chimney connector. Double wall chimney connector must be used with these slip connectors, as it cannot be trimmed to length.

Please Note: Installation diagrams are for reference purposes only and are not drawn to scale, nor meant to be used as plans for each individual installation. Please follow all venting system requirements, maintain the required clearances to combustibles, and follow all local codes.

INSTALLATION

Approved Venting Method 2: Through the Ceiling

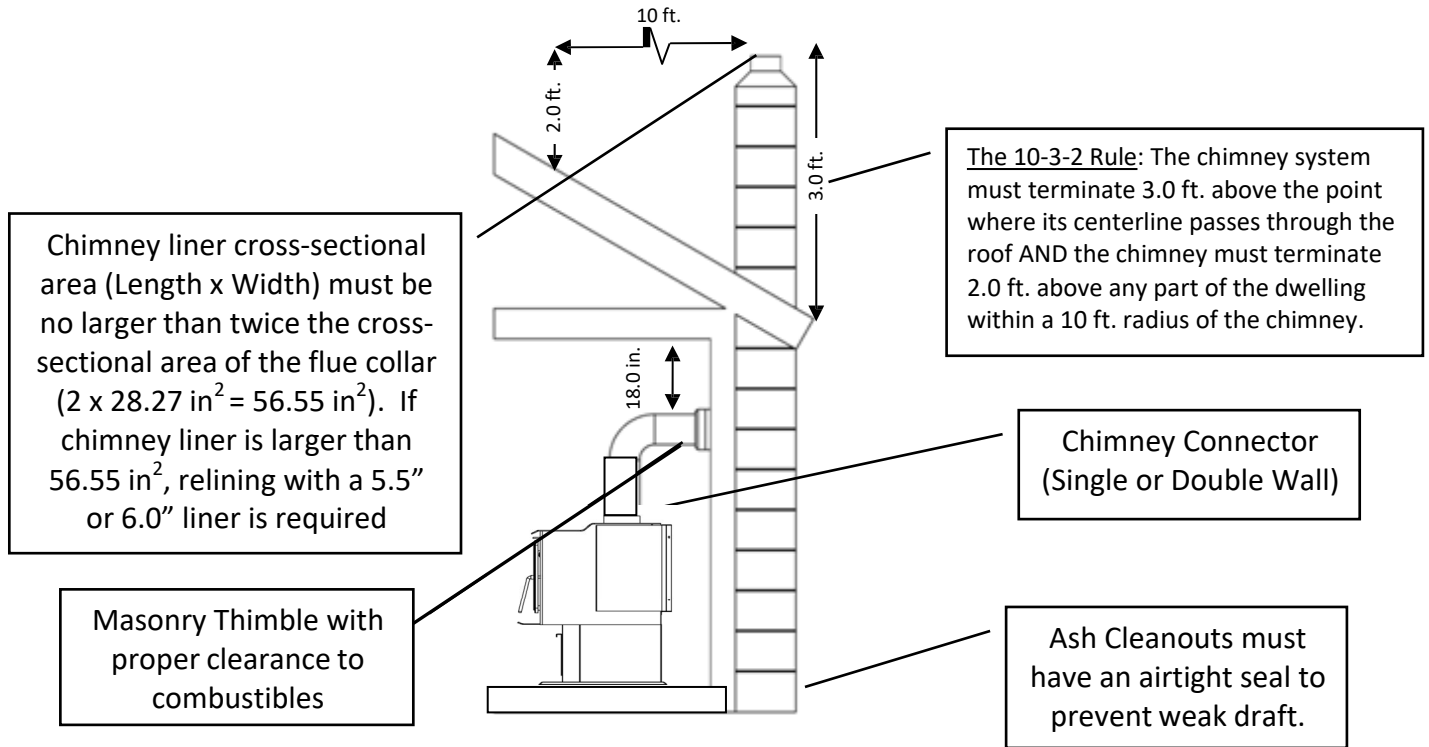


- Prefabricated chimney systems must conform to UL-103HT (2100 °F) for the U.S. and ULC-S629 (650°C) for Canada.
- This wood burning unit is only listed for installation with 6.0" diameter chimney connector and chimney systems. Installing this unit on prefabricated chimneys larger than 6.0" diameter will result in decreased draft and the potential for poor unit performance.
- Follow all venting system manufacturer's installation requirements and required clearances.
- Use three sheet metal screws at each single wall chimney connector joint (check manufacturer's recommendations when double wall chimney connector is used).
- Drill three holes in the flue collar of the unit and attach the chimney connector to the unit using sheet metal screws (holes should be pre-drilled in flue collar from factory).
- Properly attach the prefabricated chimney system to the home in strict accordance with the prefabricated chimney system manufacturer's instructions.
- The overall length of the chimney connector must not exceed 8.0 ft. In the case of cathedral ceilings, the prefabricated chimney system should extend to 8.0 ft. from the top of the unit.
- Special adapters and slip connectors are available to eliminate the need to cut single wall chimney connector. Double wall chimney connector must be used with these slip connectors, as it cannot be trimmed to length.

Please Note: Installation diagrams are for reference purposes only and are not drawn to scale, nor meant to be used as plans for each individual installation. Please follow all venting system requirements, maintain the required clearances to combustibles, and follow all local codes

INSTALLATION

Approved Venting Method 3: Internal or External Masonry Chimney System



- Follow the rules listed above concerning maximum permissible flue liner size; installing this unit on masonry chimneys exceeding 56.55 in^2 in cross-sectional area will result in decreased draft and the potential for poor unit performance.
- Use three sheet metal screws at each single wall chimney connector joint (check manufacturer's recommendations when double wall chimney connector is used).
- Drill three holes in the flue collar of the unit and attach the chimney connector to the unit using sheet metal screws (holes should be pre-drilled in flue collar from factory).
- Avoid numerous elbows and excessive horizontal runs as both will lead to poor draft and increased creosote accumulation. Horizontal runs of chimney connector must never exceed 4.0 ft. and the overall length of the chimney connector must not exceed 8.0 ft.
- A tight seal at the thimble is crucial for proper unit performance and to create a safe installation. Use the proper adapter designed for connecting single or double wall chimney connector to a masonry thimble.
- Have existing masonry chimneys inspected for safety and proper clearances to combustibles before putting them into service; a qualified chimney sweep can perform this inspection.
- External masonry chimneys often suffer cold downdrafts and poor draft performance even when they meet the cross-sectional area rules. In this case, a 6.0" insulated liner may be necessary.

Please Note: Installation diagrams are for reference purposes only and are not drawn to scale, nor meant to be used as plans for each individual installation. Please follow all venting system requirements, maintain the required clearances to combustibles, and follow all local codes.

INSTALLATION

INSTALLATION INTO A MASONRY FIREPLACE

Preparation

Measure your hearth to ensure it is large enough to accept the unit.

Unit must have a 36" clearance from the top of the stove to a mantel in accordance with NFPA 211

For the USA: Hearth must extend at least 16 in. from the front of the fuel opening.

For Canada: Hearth must extend at least 18 in (450.0 mm) from the front of the fuel opening.

Keep in mind that this type of a installation will make it difficult to change speeds on the blower frequently. We recommend picking a blower speed and sticking with it, since adjusting the blower will be difficult because of the tight installation.

WARNING: DO NOT ATTEMPT TO ADJUST BLOWER DURING OPERATION. SKIN BURNS MAY OCCUR WHEN MAKING CONTACT WITH THE UNIT. WAIT FOR UNIT TO COMPLETELY COOL BEFORE ATTEMPTING TO ADJUST BLOWER.

Inspect your hearth to be sure it is constructed of a noncombustible material such as brick or stone. Do **not** install this stove on a hearth that is constructed of wood framework that is covered by brick or stone and do **not** install this unit in a zero (0) clearance fireplace. The manufacturer will not be held responsible for an accident resulting from this stove being installed on a hearth constructed of a combustible material.

Inspect your fireplace to ensure it is in proper working order and free of any obstructions.

Prior to installation, remove the existing damper or wire it to fasten it open.

Venting Your Stove - Direct Connect

When this unit is direct connected it will require six inch (6") diameter 24 gauge pipe from the stove through the damper opening. **(NOTE: The chimney connector must be attached to the appliance with a minimum of three (3) screws, and 3 screws should be used to attach each adjoining section.)**

We highly recommend having the chimney fully lined with a 6 inch liner to ensure proper draft. This will make it necessary to block off the open area on both sides of the pipe that passes through the damper opening, which can be done with sheet metal or by packing flame retardant fiberglass insulation in the open areas (no paper or combustibles). You must be sure the draft from the chimney is being pulled through the stove, and not around the connector pipe. .

We highly recommend you have this done by a professional. You should also contact your local authorities to be sure you are following all codes.

INSTALLATION

WARNING

DO NOT INSTALL IN A SLEEPING ROOM.

CAUTION

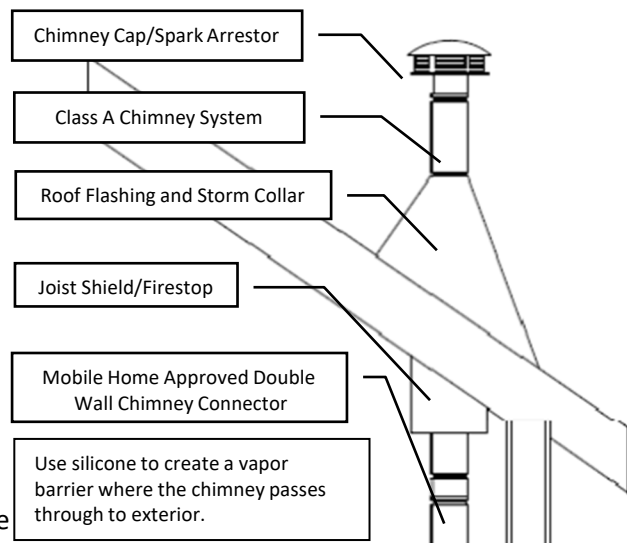
THE STRUCTURAL INTEGRITY OF THE MANUFACTURED HOME FLOOR, WALL AND CEILING/ROOF MUST BE MAINTAINED.

Caution

NEVER draw outside combustion air from: Wall, floor or ceiling cavity or enclosed space such as an attic, garage or crawl space.

Mobile Home Installation

- The wood stove **MUST** be secured to the floor of the mobile home using lag bolts and the holes provided in the bottom of the unit for this purpose. Outdoor-aired space heaters must be attached to the structure. Use a #8 copper wire to ground stove to frame of mobile home.
- The wood stove must be connected to the chimney system with double wall chimney connector which is UL listed for use in mobile and manufactured homes.
- Carefully follow all clearances listed in the appropriate section of this manual AND follow the venting manufacturer's minimum clearance requirements. Similarly, be certain the venting system used is approved for mobile home use.
- Installation must be in accordance with Manufacturers Home & Safety Standard (HUD) CFR 3280, Part 24 as well as any applicable local codes.

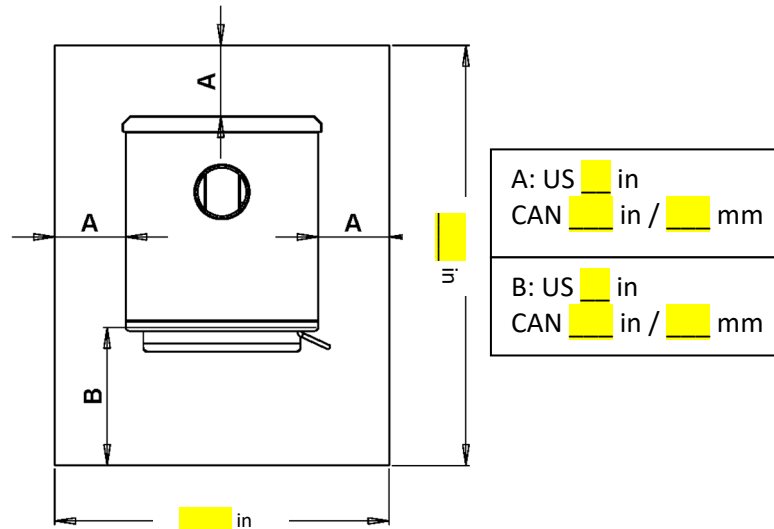


Outside Combustion Air

- The use of outside combustion air is **mandatory** when installing this wood stove in a mobile or manufactured home.
- The outside air connection pipe protrudes from the bottom center of the stove; a kit is available from England's Stove Works, Inc. designed for connecting this unit to outside combustion air. [Part No. AC-OAK3]
- If it is not feasible to use the AC-OAK3 outside air hookup kit in your stove installation, other materials may be used, provided the following rules are followed:
 - The pipe used for outside air hookup must be metal, with a minimum thickness of .0209in. (25 gauge mild steel) or greater and an inside diameter of approximately 2.75 in.
 - Keep pipe runs short and use a mechanical fastener at each pipe joint.
 - A screen or other protection device must be fitted over the outside air termination point to prevent rain, debris and nuisance animals from entering the piping system. Inspect the outside combustion air inlet for block and debris monthly.

FLOOR PROTECTION

- This wood stove requires a U.L. listed (ULC if Canada) floor protector with a R factor of no less than [redacted], if the stove is to be installed on a combustible floor. If the floor the stove is to be installed on is already non-combustible (i.e. a concrete floor in a basement), no floor protection is needed (although a decorative floor protector can still be used for aesthetic reasons).
- When using any floor protector, consider that this stove is not only heavy but will induce heating and cooling cycles on the floor protector which can damage tile and loosen mortar and grout joints located near the stove.
- The floor protector should be UL approved or equivalent (ULC if Canada) and must be noncombustible. A hearth rug is NOT an approved substitute for a proper hearth pad.
- For the US: The floor protector must extend at least [redacted] in. from the front of the fuel opening, [redacted] in. from the sides of the door opening and [redacted] in. from the rear of the unit.
- For Canada: The floor protector must extend at least [redacted] mm from the front of the fuel opening, [redacted] mm from the sides of the door opening and [redacted] mm from the rear of the unit.



- The floor protector must extend 2 in. (50.8 mm.) on either side of any horizontal venting runs and extend directly underneath any vertical venting pipe.

CAUTION

NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR "FRESHEN UP" A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER WHILE IN USE. ADDITIONALLY, NEVER APPLY FIRE-STARTER TO ANY HOT SURFACE OR EMBERS IN THE STOVE.

OPERATION

Break-In Fires

- This wood burning unit is constructed of heavy gauge steel and cast iron and is built to last a long time. However, in order to ensure no excessive thermal stresses are induced on the metal during the first fire, three break-in fires should be burned, each one slightly hotter than the last. These break-in fires will not only help the stove body acclimate to the high temperatures of the fire, but will also slowly cure the high temperature stove paint, which will ensure the high quality finish lasts for years.
 - WE HIGHLY RECOMMEND burning your break-in fires outdoors, as the paint and manufacturing oils will ‘burn off’ the stove exterior somewhat during this time. If you do burn them indoors with your flue system, open doors and windows to ventilate.
- This stove has a single air control rod which regulates the wood burn rate; when the primary air control slide is pushed all the way into the unit, the stove will burn more slowly and put out heat over a longer time period. Conversely, when the air control slide is pulled all the way out, the unit will burn more quickly and put out a larger amount of heat over a relatively shorter time period. Do not attempt to modify the range of air control adjustment for any reason.
- The first break-in fire should be just a large kindling fire, getting the stove to about 300°F as measured by a magnetic thermometer on the right or left side of the stove, above the door. Once this temperature has been reached, allow the fire to die out with the air control open. The second and third break-in fires should be a bit larger, with some small dry splits added to the kindling load. The temperature goal during these fires is about 350°F – 450°F; don’t let the fire get hotter than that.

Continuous Operation – Daily Operation after your Break-In Fires

Start-up

- Load the firebox with wood, split to moderate size.
- On top of the startup wood, add dry kindling split into very small pieces.
- Ignite the kindling from the top until a flame is established.
- Close the door and set the damper to High (fully open) to reduce the amount of smoke.

High Burn

- Be sure the dog box is not covered with ashes or coals (see Brick Layout, page 33, for dog box location).
- Load wood load onto the coal bed after chopping and packing coals, if necessary.
- Close the door, set the damper to High (fully open) and set blower to High speed.

Low Burn

- Be sure the dog box is not covered with ashes or coals (see Brick Layout, page 33, for dog box location).
- Load wood load onto the coal bed after chopping and packing coals, if necessary.
- Close the door, set the damper to High and set blower to High speed.
- After 15 minutes, set the damper to Low (fully closed) and set blower to Low speed.

Medium Burn

- Be sure the dog box is not covered with ashes or coals (see Brick Layout, page 33, for dog box location).
- Load wood load onto the coal bed after chopping and packing coals, if necessary.
- Close the door, set the damper to ½ closed and set blower to High speed.
- After 15 minutes, set the blower to Low speed.

OPERATION

- England’s Stove Works, Inc. always recommends the use of a magnetic stove thermometer, so that the temperature of the unit can be monitored. When using a magnetic stove thermometer, locate the thermometer above the door on either the left or right side of the stove and use the following temperatures as rough guidelines to determine the burn rate and heat output level of the stove:
 - Normal wood stove operation should occur between 350°F (177°C) and 550°F (288°C), with 350°F (177°C) to 450°F (232°C) being a low to medium heat output level and 450°F (232°C) to 550°F (288°C) being a medium to high heat output level. Operating the stove at 600°F (316°C) would be considered the maximum continuous operating temperature permissible and unit damage may result from operating at that high of a burn rate for extended time periods. Allowing the unit to reach 750°F (398°C) or higher is defined as over-firing and will result in unit damage.
- The optional room air convection blower was designed to extract the maximum amount of heat from the stove, for the highest possible heat transfer into the room. Since the blower is so efficient at removing heat from the unit, it is very important to only operate the room air blower after a fresh wood load has been allowed to burn for at least thirty (30) minutes. Allowing a fresh load of wood to burn without the blower on ensures that the entire unit reaches proper operation temperatures and that the secondary combustion system is functioning properly. Additionally, follow the guidelines below for acceptable blower speeds.
- When using the optional room air convection blower (Part No. AC-16, or you can upgrade to the AC-30), the blower should be operated as follows depending on heat output level:

Burn Rate	High	Medium High	Medium	Medium Low	Low
Blower Speed AC-16	High	High	Low	Low	Low
Blower Speed AC-30	High	Medium High	Medium	Medium Low	Low

Creosote – Formation and Need for Removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool 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 and chimney connector should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of chimney fire.

DO NOT USE GRATES OR ANDIRONS OR OTHERWISE ELEVATE FIRE – BUILD WOOD FIRE DIRECTLY ON HEARTH
DO NOT OPERATE WITH THE MAIN DOOR OPEN – OPERATING THE STOVE WITH THE MAIN DOOR OPEN WILL CREATE AN OVER-FIRE

In the event of a creosote or soot fire (chimney fire), close the air control on the stove, contact the local fire department and get out! Do not throw water on the fire! Contact your local fire authority for more information on how to handle a chimney fire and develop a safe evacuation plan for you and your family in the event of a chimney fire.

DO NOT STORE FUEL CLOSER THAN SPECIFIED CLEARANCES TO COMBUSTIBLES OR WITHIN THE SPACE NEEDED FOR LOADING THE STOVE AND FOR ASH REMOVAL.

OPERATION

Additional Safety Guidelines

CAUTION: When adding fuel to the stove, the blower must be turned OFF.

- The installation of smoke detectors is highly recommended when installing this or any other solid fuel burning appliance. Smoke detectors should be located near or in every room of the home, particularly sleeping rooms.
- A smoke detector can be installed in the same room as this cordwood burning unit; installing the smoke detector too close to the unit can lead to nuisance alarms due to slight wisps of smoke emitted during the fire starting or reloading process. Due to this, the smoke detector in the same room as the unit will be most useful if it is located as far from the unit as the room will permit.
- This stove is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried, seasoned hardwoods, as compared to soft woods or to green or freshly-cut hardwoods. **DO NOT BURN garbage, lawn clippings or yard waste, materials containing rubber, including tires; Materials containing plastic: Waster 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 previously salt water saturated materials; Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater. Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.**
- Burning fuels other than cordwood, particularly coal and charcoal, can result in hazardous concentrations of carbon monoxide being emitted into the dwelling. For these reasons, NEVER burn coal or charcoal in this cordwood stove. Installing a carbon monoxide detector and being aware of the symptoms of carbon monoxide poisoning can help reduce the risk of carbon monoxide related issues.
- This unit was designed for operation only with the loading door closed and tightly latched. Operating this unit with the loading door latched loosely or open will allow excessive combustion air to reach the fire and will result in dangerously high unit temperatures. High unit temperatures can damage the unit, void the warranty or ignite creosote deposited in the chimney system by previous, slow burning fires.
- The natural draft that pulls air through this unit and allows the fire to burn uses the indoor air of the dwelling for combustion, unless the unit is connected to an outside combustion air source. Kitchen range vent hoods, furnaces and other air movement appliances in the home are often also removing air from the dwelling; if the amount of air filtration or leakage back into the home is exceeded by the air being removed, negative pressure may be created in the home.
- Since this is a natural draft appliance, it will often be the first appliance to have problems related to negative pressure. If smoke is forced out the chimney connector joints or out of the air induction system of the unit, the unit is likely fighting negative pressure in the dwelling. Cracking a window or door near the appliance can help equalize the negative pressure;

ultimately, an unrestricted source of outside combustion may be necessary for proper unit function.

- If the unit is connected to outside air, be certain to monitor the exterior inlet to the combustion system for icing or snow accumulation. Allowing the outside air connection to become restricted will result in air starvation to the unit.

Safe Wood-Burning Practices

Once your wood-burning appliance is properly installed, follow these guidelines for safe operation:

- Keep all flammable household items—drapes, furniture, newspapers, and books—far away from the appliance.

Start fires only with newspaper, dry kindling and all natural or organic fire starters. Never start a fire with gasoline, kerosene, or charcoal starter.

Do not burn wet or green (unseasoned) logs.

Do not use logs made from wax and sawdust in your wood stove—they are made for open hearth fireplaces. If you use manufactured logs, choose from those made from 100 percent compressed saw dust.

Build hot fires. For most appliances, a smoldering fire is not a safe or efficient fire.

Keep the doors to your wood-burning appliance closed unless loading or stoking the live fire. Harmful chemicals, like carbon monoxide, can be released into your home.

Regularly remove ashes from your wood-burning appliance into a metal container with a cover. Store the container of ashes outdoors on a cement or brick slab (not on a wood deck or near wood). See ash removal instructions in your owner's manual.

Keep a fire extinguisher handy.

Remember to check your local air quality forecast before you burn.

MAINTENANCE

Daily Maintenance

- Inspect the firebox for ash accumulation; remove excess ash and follow instructions below regarding disposal. Ash should not be allowed to accumulate in the stove to the point that it covers the dog box hole (see Brick Layout, page 33, for dog box location).

Monthly Maintenance

- Check the blower for dust accumulation (if installed); check the door handle for proper operation and to be certain an airtight seal is still being made by the door.
- Inspect the chimney system and chimney connector and sweep if necessary. Although cleaning may be required less than monthly, ALWAYS inspect the venting system monthly to decrease the chance of a chimney fire.
- Visually inspect the ceramic fiber insulating boards in the firebox for cracks and/or breakage. Slight surface cracks will not affect the performance of the boards, but cracked or crumbling boards should be replaced immediately.
- Visually inspect the secondary combustion tubes for cracks, warping and corrosion. Although these tubes are constructed from stainless steel, they operate at very high temperatures and can eventually wear out from normal use.

Yearly Maintenance

- Check all gaskets (window and door) for wear and to be certain they still maintain an airtight seal. See the following page for instructions.
- Thoroughly clean the chimney system and the chimney connector system. Since the chimney connector is generally exposed to high exhaust temperatures, inspect it carefully for leaks and weak spots; replace any questionable pieces. [In the case of straight through the roof chimney system, be certain to remove the ceramic fiber baffles **before** pushing the chimney sweeping brush down into the firebox. Forcefully hitting the top of the baffle with a cleaning brush or rod can damage or destroy the baffle.]
- Remove all ash from the stove, including the ash which accumulates on the top of the firebox baffles. Leave the air control open during the non-heating months to allow some air to flow through the stove to help prevent corrosion. A small open container of cat litter in the stove can help prevent corrosion during the humid summer months; be certain to remove it before building a fire in the fall.

IMPROPER GASKET MAINTENANCE, INCLUDING FAILURE TO REPLACE GASKETS, CAN CAUSE AIR LEAKS RESULTING IN AN UNCONTROLLABLE FIRE IN THE UNIT.

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

MAINTENANCE

Inspecting Gaskets

An airtight seal at the door opening is crucial to proper stove performance. Any air leakage at this area can cause an over-fire situation and is therefore a serious safety threat. Because of this, gaskets should always be maintained in good condition. Gasket tightness can be checked using the “dollar-bill” method:

- Place a dollar bill between the gasket and the stove body (at the location where the gasket meets the stove).
- Close and tighten the door then attempt to pull the dollar bill out. If the dollar bill slides in and out easily, the gasket needs to be replaced. This test should be repeated around the entire gasket perimeter, as gaskets will sometimes seal tightly on one side, but will be worn and seal poorly on another side.
- Perform this test around the entire perimeter of the door, and visually inspect the window gasket for any leaks. Leaks in the window gasket can generally be located by following the prevailing soot trails left on the window after burning the unit.
- If any area fails the test, the entire gasket should be replaced. The part number appropriate to the gasket being replaced can be found in the “Illustrated Parts” section of this manual.
- Gaskets should only be replaced with equivalent fiberglass gaskets purchased from England’s Stove Works[®] specifically for this unit.

Gaskets

1. Door - This unit comes with a ¾” rope gasket around the door that should be replaced at least every year. To replace the door gasket (Part # AC-DGKHD), the old gasket must first be removed entirely — prior to adding the new adhesive, you may have to scrape the old cement from the door channel. Once the cement and gasket have been added, the door should be closed and latched for twenty-four hours to allow the cement to harden.
2. Window - If you are replacing the window gasket (Part # AC-GGK), the new gasket will already have adhesive on one side. First, remove the old gasket. Next, remove the paper on the adhesive side and place the gasket around the outside edge of the glass, centered over the edge. Fold the gasket edges over on the glass, forming a “U” shape.

Finish

This new unit has been painted with High-Temperature Paint that should retain its original look for years. If the unit should get wet and rust spots appear, the spots can be sanded with fine steel wool and repainted. It is crucial that only High-Temperature Spray Paint is used (Part # AC-MBSP), as others may not adhere to the surface or withstand the high temperatures. Similarly, some brands of paint will not adhere to different brands of paint, so we highly recommend using our proprietary High-Temperature Spray Paint.

REPLACING COMPONENTS

Glass

This unit has a ceramic glass panel (Part No. AC-G51) in the viewing door; self adhesive glass gasket is included with replacement glass (purchase directly from England's Stove Works). Never replace ceramic glass with tempered or any other type of glass and never operate this unit with cracked or broken glass.

- Glass Size: 20.75 in. (527.05 mm) x 12.625 in. (320.67 mm)
- Glass Type: 5mm Ceramic Glass (Keralite Pyroceram)
- Glass Manufacturer: Eurokera

Glass Precautions

1. Never replace ceramic glass with tempered or any other type of glass.
2. Never operate this unit with cracked or broken glass.
3. Do not slam the door or strike the glass with any objects.
4. Do not build the fire directly against the glass.

Glass Cleaning

1. Be certain the stove **and** the glass are completely cool.
2. The build-up on the glass will generally be light and water is normally sufficient to remove the deposits. If stubborn soot persists, use a cleaner made specifically for this purpose. Do not scrape the glass or use abrasive cleaners.
3. Rinse the glass with clean water and dry the glass before resuming normal operation.

Glass Replacement

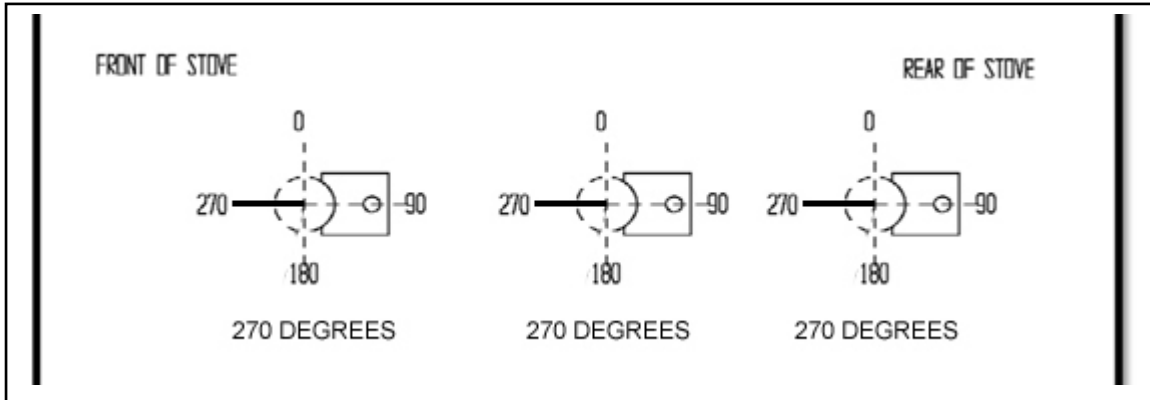
1. Remove the door from the stove and rest it face down on a firm work surface.
2. Using a 5/16" wrench, remove the four window bracket retaining screws.
3. Remove the four window tabs from the door. Take extra care to avoid shards of glass if the glass window has been broken.
4. Lift the old glass panel out of the door and discard.
5. The glass panel must be wrapped with a self-adhesive fiberglass tape gasket (AC-GGK). If you purchased a new glass, it will come already wrapped. If reusing the same piece of glass, remove old gasket, scrape off old adhesive and wrapped with the AC-GGK. This gasket serves to cushion the glass from the cast iron door.
6. Reinstall the window retaining tabs using the four screws previously removed. Do not over-tighten the screws.

To remove the decorative insert, simply remove the glass, then the insert.

REPLACING COMPONENTS

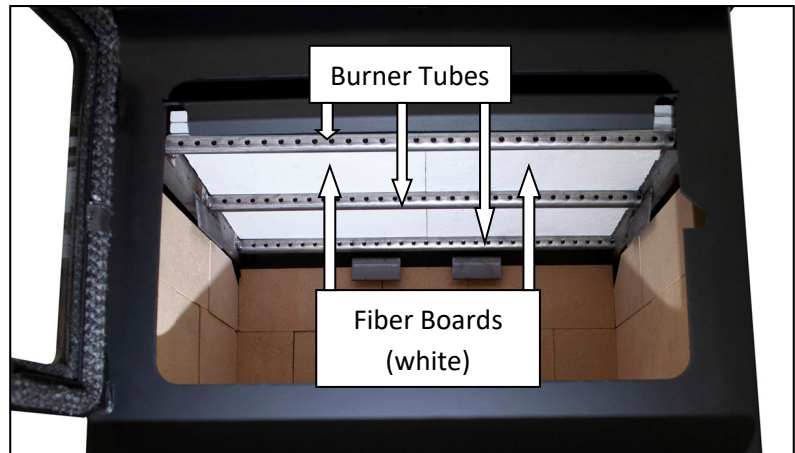
Burner tube replacement

There are three different burner tubes in the top of the stove. To replace a tube, first be sure that you order the correct tube you need to replace. Then using a 5/16" socket or open end wrench, remove the screw located on the left side of the tube. Be sure to keep the screw. Push the tube to the right then remove the tube (pulling the tube back to the left after that side has been removed from the hole). To replace, reverse the above procedure...make sure to install the tubes in the correct order. (Front to Back)



Ceramic fiberboard replacement

There are four fiber boards located in the top of this stove, in two layers. While the bottom layer is oriented 'North/South' as shown, the top layer is oriented 'East/West'. To replace a cracked or broken board, first remove the front burner tube. Then remove the board you need to replace. Install the new board (the boards should sit flush together side by side). Replace the tube previously removed.



Dog box replacement

See Brick Layout (page 33) for dog box location in the firebox.

To replace the dog box, first remove the ash pan. Then remove the two 9/16" nuts that hold the carriage bolts in place. Open the front door of the stove and lift up on the dog box. Install new or existing carriage bolts into the holes on the flange of the dog box and re-install in the reverse manner in which it was removed.

Heat shield removal

There are two 5/16" screws that are on the rear of the heat shield. To remove the heat shield, using a 5/16" socket or open ended wrench, remove the two screws. Then pull the heat shield up and back off the back panel.

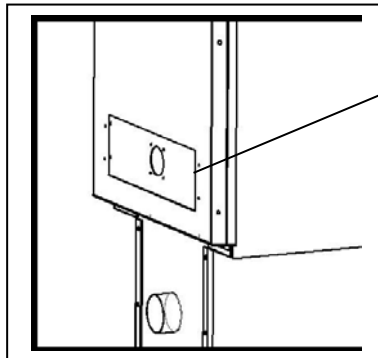
OPTIONAL ACCESSORIES

Blower: The wood stove was also designed for use with a convection blower for additional heat circulation. The stove is constructed with side convection channels which allow the room air blower to pick up heat from the hottest regions of the stove and transfer it into the home. The mounting screws for the blower are installed into the rear convection channel at the factory; mounting the blower only requires a 5/16" open end or socket wrench to remove these screws and install the blower.

When routing the power cord, take care to keep away from hot areas of the unit and remember that this blower is for use only with the stove. Please see the diagram below for clarification on the room air blower installation.

This unit can use the AC-16 (which comes standard with the unit) or the AC-30 upgrade blower. Both are installed using the four factory installed 5/16" screws.

The optional heat circulation blower on this stove requires periodic lubrication; this lubrication should be performed no less than every three months of normal operation. To properly lubricate the blower, use an eye dropper or similar dispensing device to drip 5-7 droplets of SAE 20 oil into the oil port on the side of the blower motor.



(4) 5/16" head, self-tapping screws (pre-installed in unit).

Warning: Disconnect power from fan before installation.

The unit should be unplugged during the summer months (and periods of non-use), to help protect against the possibility of damage due to lightning strikes and other power disruptions.

EPA Certified to comply with 2020 particulate emission standards using cord wood.

EPA INFORMATION

The following additions to your owner's manual will enable you to achieve optimal emissions performance from your stove. Important safety tips are also included.

- *Proper Installation* – Please refer to the Installation section of your owner's manual and follow the guidelines listed therein for safety and for optimal emissions performance.

Additional information:

Venting Introduction:

Draft: Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may damage the catalytic combustor. Inadequate draft may cause backpuffing into the room and 'plugging' of the chimney or the catalyst.

Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints.

An uncontrollable burn or excessive temperature indicates excessive draft.

Please be mindful of installation location: Inversion and other air quality issues can arise in valleys or if unit is installed close to neighboring homes.

This wood stove operates on a natural draft system, in which the chimney system pulls air through the stove. This unit must be installed in accordance with the following detailed descriptions of venting techniques; not installing the stove in accordance with the details listed here can result in poor stove performance, property damage, bodily injury or death. Avoid make-shift compromises when installing the venting system. England's Stove Works is not responsible for any damage incurred due to a poor or unsafe installation.

Be certain that all aspects of the venting system are installed to the venting manufacturer's instructions, particularly the required clearances to combustibles. Also, be certain to use an attic radiation shield to prevent insulation from contacting a chimney which passes through an attic.

The chimney system is the "engine" which drives a wood stove, so it is imperative for proper unit function that the venting system be installed exactly as described in the following section.

If questions arise pertaining to the safe installation of the stove, our Technical Support line (800-245-6489) is available. Contact your local code official to be certain your installation meets local and national fire codes, and if you're uncertain about how to safely install the stove, we strongly recommend contacting a local NFI certified installer to perform the installation.

Venting Guidelines:

ALWAYS install vent pipe in strict adherence to the instructions and clearances included with your venting system.

- **DO NOT** connect this wood stove to a chimney flue which also serves another appliance.
- **DO NOT** install a flue pipe damper or any other restrictive device in the exhaust venting system of this unit.
- **USE** an approved wall thimble when passing through a wall and a ceiling support/fire stop when passing through a ceiling.
- **INSTALL** three sheet metal screws at every chimney connector joint.
- **AVOID** excessive horizontal runs and elbows, as both will reduce the draft of the venting system and will result in poor stove performance.
- **INSPECT** your venting system often, to be certain it is clear of creosote, fly-ash and other restrictions.
- **CLEAN** the venting system as detailed in the maintenance section of this manual.
- **ADHERE** to the 10-3-2 rule regarding chimney terminations.
- **INSTALL** single wall chimney connector with the male end **down** to prevent creosote leakage. Follow double wall chimney connector manufacturer's instructions regarding proper pipe installation.

WARNING: Venting system surfaces get HOT, and can cause burns if touched. Noncombustible shielding or guards may be required

The 10-3-2 Rule: The chimney system must terminate 3.0 ft above the point where it's centerline passes through the roof AND the chimney must terminate 2.0 ft. above part of the dwelling within a 10 ft. radius of the chimney.

- *Operation and Maintenance* – Please refer to the 'Operation' (Operating Instructions) and Maintenance (including Ash Removal/Disposal) sections of your owner's manual and follow the guidelines listed therein for safety *and* for optimal emissions performance.

Additional Information:

Following the instructions in your owner's manual for Building a Fire will ensure a proper fire, as well as helping minimize visible emissions.

More:

- *Fuel loading and re-loading:* Practical Tips for Building a Fire – See your owner's manual for information on loading (and re-loading) your fuel, as well as for fire-starting procedures (i.e. 'Building a Fire').
- *Top-Down Fires:* The US EPA recognizes 'the effectiveness of the top-down approach for starting fires.' A good tutorial for this approach may be found at <http://woodheat.org/top-down-steps.html> . When building top-down fires, be sure to follow the instructions found in your owner's manual and contact our Technical Support if you have any questions.

- *Fuel Selection:* Once your wood-burning appliance is properly installed, building an effective fire requires good firewood (using the right wood in the right amount) and good fire building practices. The following practical steps will help you obtain the best efficiency from your wood stove or fireplace.
- Season wood outdoors through the summer for at least 6 months before burning it. Properly seasoned wood is darker, has cracks in the end grain, and sounds hollow when smacked against another piece of wood.
- Store wood outdoors, stacked neatly off the ground with the top covered.
- Burn only dry, well-seasoned wood that has been split properly.
- Start fires with newspaper and dry kindling as discussed earlier in the manual.
- Burn hot fires.
- To maintain proper airflow, regularly remove ashes from your wood-burning appliance into a metal container with a cover and store outdoors.

Moisture Meter Information

- Firewood is ready at 10-25% moisture content.
- Newly-cut logs can have a moisture content (MC) of 80% or more, depending on species. Since wood shrinks, and can also split, twist or otherwise change shape as it dries, most wood is dried before being used. Air drying, or 'seasoning,' is the most common method used for cord wood. In most parts of the United States, the minimum moisture content that can be generally obtained in air drying is about 12 to 15 percent. Most air-dried material is usually closer to 20 percent moisture content when used
- To test your firewood, simply push the pins into the wood and wait for a reading. Remember, **don't just stick the meter into the ends of your firewood.** To get the most accurate reading, split the wood and test the center. The center of the log will contain the most moisture.

How Far Should I Drive Non-Insulated Pins into Wood?

- To full depth if possible. However, at moisture levels below 10%, it is usually sufficient to make good, positive contact with the wood. At higher levels of moisture and especially if you have a steep gradient, full penetration is a must.

- **WHAT FUELS NOT TO USE:**

CAUTION

- **NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR “FRESHEN UP” A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER WHILE IN USE. ADDITIONALLY, NEVER APPLY FIRE-STARTER TO ANY HOT SURFACE OR EMBERS IN THE STOVE. DO NOT USE CHEMICALS OR FLUIDS**
 - **TO START THE FIRE.**
- **DO NOT BURN FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTHA OR ENGINE OIL.**
- **DO NOT BURN GARBAGE; LAWN CLIPPINGS OR YARD WASTE; MATERIALS CONTAINING RUBBER, INCLUDING TIRES; MATERIALS CONTAINING PLASTIC; WASTE PETROLEUM PRODUCTS, PAINT 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; PAPER PRODUCTS, CARDBOARD, PLYWOOD OR PARTICLEBOARD. THE PROHIBITION AGAINST BURNING THESE MATERIALS DOES NOT PROHIBIT THE USE OF FIRESTARTERS MADE FROM PAPER, CARDBOARD, SAWDUST, WAX AND SIMILAR SUBSTANCES FOR THE PURPOSE OF STARTING A FIRE IN AN AFFECTED WOOD HEATER. BURNING THESE MATERIALS MAY RESULT IN RELEASE OF TOXIC FUMES OR RENDER THE HEATER INEFFECTIVE AND CAUSE SMOKE.**

- **Safe Wood-burning Practices**

Once your wood-burning appliance is properly installed, follow these guidelines for safe operation:

- Keep all flammable household items—drapes, furniture, newspapers, and books—far away from the appliance.
- Start fires only with newspaper, dry kindling and all natural or organic fire starters. Never start a fire with gasoline, kerosene, or charcoal starter.
- Do not burn wet or green (unseasoned) logs.
- Do not use logs made from wax and sawdust in your wood stove – they are made for open hearth fireplaces. If you use manufactured logs, choose those made from 100 percent compressed sawdust.
- Build hot fires. For most appliances, a smoldering fire is not a safe or efficient fire.
- Keep the doors of your wood-burning appliance closed unless loading or stoking the live fire. Harmful chemicals, like carbon monoxide, can be released into your home.
- Regularly remove ashes from your wood-burning appliance into a metal container with a cover. Store the container of ashes outdoors on a cement or brick slab (not on a wood deck or near wood). See ash removal instructions in your owner’s manual.
- Keep a fire extinguisher handy.
- Remember to check your local air quality forecast before you burn.

- *Air Controls*: SEE YOUR OWNER’S MANUAL for information on the Proper Use of Air Controls (in the Operation section).
- *ASH REMOVAL* – Follow your Owner’s manual’s instructions regarding removal and disposal of ashes.
- *REPLACEMENT of parts that are critical to emissions performance* – Follow your Owner’s manual’s instructions regarding replacement of gaskets and other parts that are critical to emissions performance.

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

More: Burner Tubes – To replace a tube, first be sure that you order the correct tube you need to replace. Then using a 5/16” socket or open end wrench, remove the screw located on the left side of the tube. Be sure to keep the screw. Push the tube to the right then remove the tube (pulling the tube back to the left after that side has been removed from the hole). To replace, reverse the above procedure...make sure to install the tubes in the correct order. (Front to Back)

- **Smoke Detectors**

England’s Stove Works, Inc. highly recommends the use of smoke detectors in every room of the house. However, locating a smoke detector directly above this unit can result in nuisance alarms.

CAUTION

This unit is meant to operate only with door closed. Smoke spillage and an inefficient, lazy burn will result from attempting to operate the stove with the door open.

Additionally, using prohibited fuels can create an unsafe situation and can also generate excess carbon monoxide. Carbon monoxide is an odorless, colorless gas which can be deadly.

The use of a carbon monoxide detector is strongly recommended.

Compliance: EPA Certified to comply with 2020 particulate emission standards using cord wood.

- *Tamper Warning*: “This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.”
- *Warranty*: See your Owner’s manual for a Warranty Registration instruction page, as well as instructions for warranty procedures. For parts, warranty replacement procedures may be found at our parts store site: www.heatredefined.com

TROUBLESHOOTING

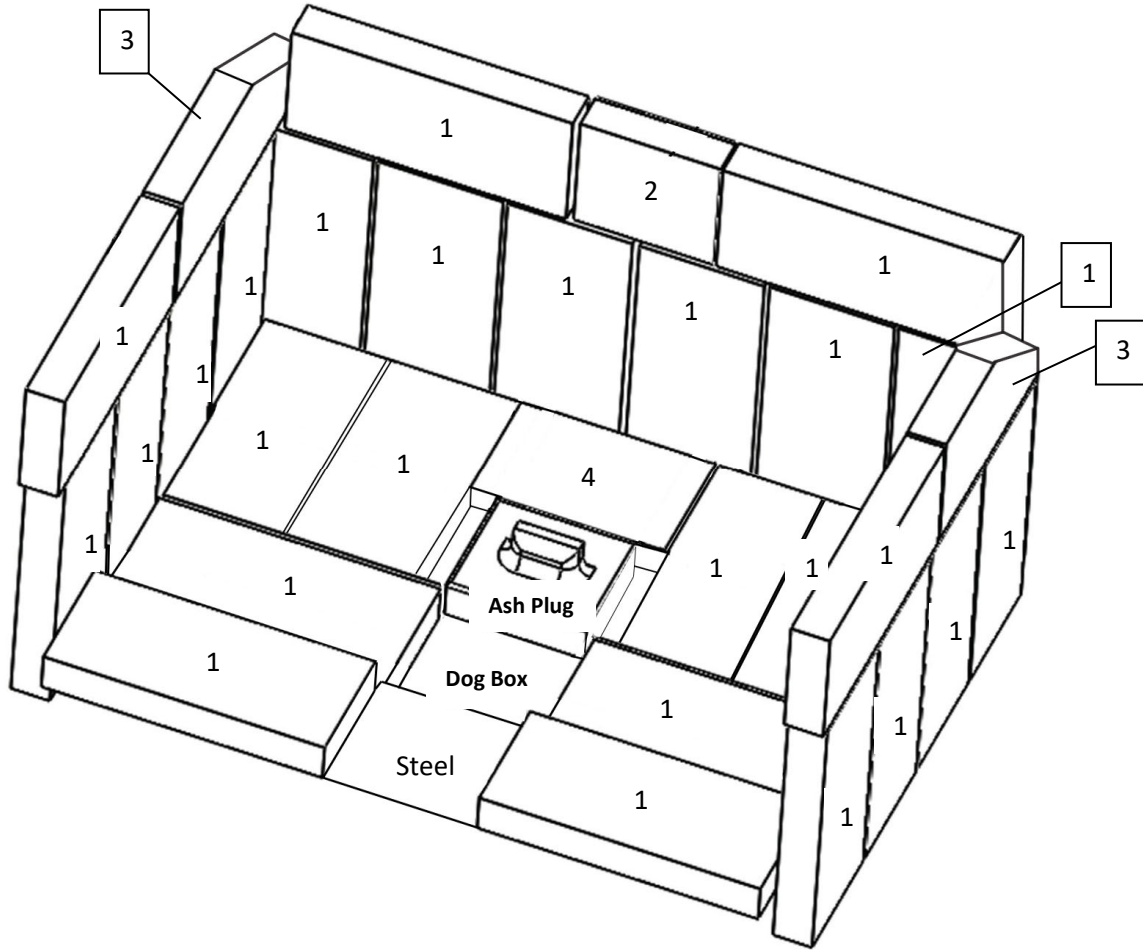
Issue	Cause	Solution(s)
Stove smokes into room	1. Weak Draft	1.1 Be certain chimney is sufficiently tall to meet the 10-3-2 rule.
		1.2 Add additional height to the chimney.
Fire is hard to start	2. Negative Pressure in the Home	2.1 Add an outside combustion air hookup to the unit.
	3. Weak Draft	3.1 Be certain chimney is sufficiently tall to meet 10-3-2 rule.
		3.2 Add additional height to the chimney system.
	4. Cold Chimney	4.1 Heat the flue first by burning crumbled newspaper in the stove.
		4.2 Install an insulated chase around external chimneys.
5. Downdraft in Chimney	5.1 Be certain chimney is sufficiently tall to meet 10-3-2 rule.	5.2 Try heating the flue with a hair-dryer to correct the draft.
Glass is dirty	6. Wet or Green Wood	6.1 Only burn wood that is seasoned for at least one year and that is dry and free of ice and snow.
	7. Operating Stove at Low Burn Rate	7.1 Operate the stove at higher burn rates to allow the air-wash system to keep the glass clean.
	8. Wood Loaded Too Close to Glass	8.1 Never load wood so that it is touching the ceramic glass viewing window.
Coals build up in firebox	9. Operating Stove at High Burn Rates	9.1 Reduce combustion air control and allow coals to burn down before reloading.
Fire burns out of control	10. Excessive Draft	10.1 Reduce chimney height.
	11. Air Leakage	11.1 Inspect window and door gaskets and replace if necessary.
	12. Burning Excessively Dry Wood	12.1 Only burn seasoned cord wood. Do not burn kiln dried wood or pallet wood.
Excessive smoke from stack	13. Operating Stove at Low Burn Rate	13.1 Operate the stove at a higher burn rate which will create secondary combustion.
	14. Wet or Green Wood	14.1 Only burn wood that is seasoned for at least one year and that is dry and free of ice and snow.
	15. Not Charring Fresh Wood Load	15.1 Char the fresh wood load until it is completely ignited and active secondary combustion is present in the firebox.

REPLACEMENT PARTS LIST

Description	Part No.	Per Unit
Rear heat shield (BOLT ON)	AC-W02HS	1
Rear panel (BOLT ON)	AC-W02RP	1
Ash drawer	AC-ADW01	1
Door	CA-W02	1
Side heat shields	AC-W01SHS	2
Large Upgrade Blower (optional)	AC-30	1
Small standard blower	AC-16	1
Glass gasket kit 3/4" flat	AC-GGK	1
Door gasket kit 3/4" high density	AC-DGKHD	1
Front burner tube	AC-W06FBT	1
Middle burner tube	AC-W02MBT	1
Rear burner tube	AC-W02RBT	1
Glass size 20.75" X 12.625"	AC-G51	1
Ceramic fiberboard	AC-W02CFB	4
Small spring handle, Nickel	AC-SH4N	1
Large spring handle, Nickel	AC-SHN	1
Blower back cover	AC-BBC30	1
Glass tabs	AC-W01GT	4
Hinge pins	AC-HP	2
Outside Air Kit	AC-OAK3	1
Air Dog Box	AC-DB02	1

***FOR BRICK LAYOUT AND PART NUMBERS PLEASE
SEE PAGE 33***

BRICK LAYOUT AND REPLACEMENT



NOTE: The bricks on the sides and rear will need to be installed after delivery

DIAGRAM NUMBER	BRICK SIZE	PART NUMBER	QUANTITY PER STOVE
1	9" X 4" X 1.25"	AC-SB	26
2	4.25" X 4" X 1.25"	AC-SB4.25	1
3	8" X 4" X 1.25" with Notch	AC-SB8x4	2
4	6.5" X 4" X 1.25"	AC-SB6.5	1
	ASH DUMP PLUG	CA-30ADP	1



Model 15-W08 50-SHW08 50-TRW08
 Solid Fuel Burning Room Heater; Free Standing Model "SUITABLE FOR
 MOBILE-HOME INSTALLATION"
 Certified to UL-1482 & ULC-627-00, EPA METHOD 28R, ASTM E3053-17,
 EPA Alt 125, CSA B415.1-10

W/N#

SERIAL NO.	<input type="text"/>
MFG. DATE	<input type="text"/>

Manufactured by:
 England's Stove Works, Inc.
 589 S. Five Forks Rd.
 Monroe, VA 24574

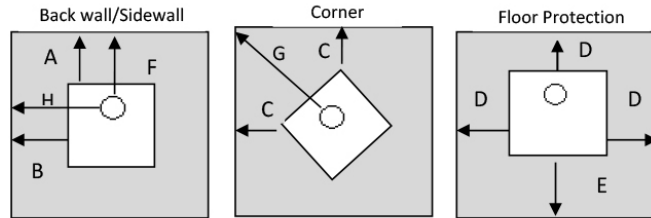
DO NOT REMOVE OR COVER THIS LABEL

- PREVENT HOUSE FIRES – INSTALL AND USE ONLY IN ACCORDANCE WITH THE OWNER'S MANUAL PROVIDED WITH THIS APPLIANCE.
- CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.

INSTALLATION REQUIREMENTS

- DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.
- USE A RESIDENTIAL TYPE MASONRY OR FACTORY BUILT CHIMNEY LISTED TO UL-103 HT (US) AND ULC-629 (CANADA).
- USE 24 GAUGE MSG BLACK SINGLE WALL CHIMNEY CONNECTOR OR LISTED DOUBLE WALL CHIMNEY CONNECTOR.
- REFER TO LOCAL CODES AND THE CHIMNEY MANUFACTURER'S INSTRUCTIONS FOR PRECAUTIONS REQUIRED FOR PASSING A CHIMNEY THROUGH A COMBUSTIBLE WALL OR CEILING.
- FOR THE US: PLACE ON A NON-COMBUSTIBLE TYPE FLOOR PROTECTOR WITH A R VALUE OF AT LEAST WHICH EXTENDS IN. TO THE FRONT AND IN. TO EACH SIDE OF THE FUEL LOADING OPENING.
- FOR CANADA: PLACE ON A NON-COMBUSTIBLE TYPE FLOOR PROTECTOR WITH A R FACTOR OF AT LEAST WHICH EXTENDS MM. TO THE FRONT AND MM. TO EACH SIDE OF THE FUEL LOADING OPENING.
- ADHERE TO THE LISTED MINIMUM CLEARANCES TO COMBUSTIBLES WHEN USING SINGLE WALL CHIMNEY CONNECTOR. SEE THE OWNER'S MANUAL FOR ADDITIONAL CLEARANCE INFORMATION.
- ONLY OPERATE THIS UNIT WITH THE DOOR CLOSED AND LATCHED TIGHTLY.
- THE MAIN LOADING DOOR CONTAINS A CERAMIC VIEWING WINDOW; DO NOT SLAM THE DOOR OR STRIKE THIS VIEWING WINDOW AT ANY TIME.
- IF THE GLASS IS CRACKED OR BROKEN, REPLACE WITH CERAMIC GLASS ONLY.
- EMISSION VALUE – 1.8 GRAMS/HR
- U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CORD WOOD.
- OPTIONAL PART- BLOWER PART NUMBER AC-30 (FASCO) ELECTRICAL RATING 115 V, 60 HZ., 0.8 A
- REFER TO PFS TECO'S DIRECTORY OF BUILDING PRODUCTS ([HTTP://WWW.PFSTECO.COM/BUILDING-PRODUCTS](http://www.pfsteco.com/building-products)) FOR DETAILED INFORMATION.

OPERATION REQUIREMENTS: FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT OVER-FIRE, IF HEATER OR CHIMNEY CONNECTOR GLOWS YOU ARE OVER-FIRING. INSPECT AND CLEAN CHIMNEY FREQUENTLY, UNDER CERTAIN CONDITIONS OF USE, CREOSOTE BUILDUP MAY OCCUR RAPIDLY. DO NOT USE A GRATE OR ELEVATE THE FIRE, BURN WOOD FIRE DIRECTLY ON THE HEARTH. RISK OF SMOKE AND FLAME SPILLAGE, OPERATE ONLY WITH DOOR FULLY CLOSED. This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.



A = inches (mm) B = inches (mm) C = inches (mm)
 D = inches (mm) E = inches (mm) F = inches (mm)
 G = inches (mm) H = inches (mm)



CAUTION - HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING, AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. SEE NAMEPLATE AND INSTRUCTIONS.

You may write your unit's Manufacture Date and Serial Number in the blank spaces on this sample tag, for future reference. This sample tag also shows the safety info. such as UL (ULC) testing standard, etc. for your local officials, or anyone else who may need reference information.

For parts, warranty replacement procedures may be found at our parts store site:
heatredefined.com

LIMITED FIVE (5) YEAR WARRANTY

From the date of purchase to the original owner

The manufacturer extends the following warranties:

Five Year Period:

1. Carbon steel and welded seams in the firebox are covered for five (5) years against splitting.
2. The cast iron door and hinges are covered for five (5) years against cracking.

One Year Period:

1. Electrical components, accessory items, glass and the painted surface of the stove are covered for one (1) year from the date of purchase.

Conditions and Exclusions

1. Damage resulting from over-firing will void your warranty.
2. This warranty does not apply if damage occurs because of an accident, improper handling, improper installation, improper operation, abuse or unauthorized repair made or attempted to be made.
3. The manufacturer is not liable for indirect, incidental, or consequential damages in connection with the product including any cost or expense, providing substitute equipment or service during periods of malfunction or non-use.*
4. All liability for any consequential damage for breach of any written or implied warranty is disclaimed and excluded.
5. This warranty does not cover internal wear parts of the combustion system, including the firebrick lining and gaskets.
6. Warranty is void if unit is not used according to the owner's manual.

Some states do not allow the exclusion of limitations of incidental or consequential damages, so the above may not apply to you.

Procedure

Purchaser must give notice of claim of defect within the warranty period and pay transportation to and from a service center designated by the manufacturer. The dealer from which the unit was purchased or the factory, at our option, will perform the warranty service.

Other Rights

This warranty gives you specific legal rights; you may also have other rights, which may vary from state to state.

Important Notice

This registration information **MUST** be on file for this warranty to be valid. Please mail this information, along with a copy of the sales receipt, within thirty (30) days from the original date of purchase.

Use any of these three easy ways to send your warranty information in!

Mailing Address

England's Stove Works, Inc.
Technical Support Department
P.O. Box 206
Monroe, Virginia 24574

Fax Number

(434) 929-4810 – Twenty-four hours a day.

Online Registration

Visit our warranty registration website at:

www.heatredefined.com

(WARRANTY CARD LOCATED ON NEXT PAGE)

For parts, warranty replacement procedures may be found at our parts store site: www.heatredefined.com

WARRANTY REGISTRATION for England's Stove Works®

Purchaser Information

I. Purchased By (Name) _____

II. Address _____

III. City _____ State _____ Zip Code _____

IV. Telephone Number _____

V. Email Address _____

Dealer Information

VI. Purchased From _____

VII. Address _____

VIII. City _____ State _____ Zip Code _____

Unit Information

*Refer to the sticker on the back of the manual or box to complete this section.

IX. Model Number _____ Purchase Date _____

X. Purchase Price _____

XI. Serial Number _____ Mfg. Date _____

Purchase Questions

How did you first hear about our product? (Please check one)

Word of Mouth _____ Burn Trailer Demonstration _____ Internet _____

Other: _____

Where did you receive information about our product?

Via Telephone _____ Dealer (Name of dealer) _____ Internet _____

Other: _____



15-W06, 50-SHW06, 50-SHW06L, 50-TRW06
INSTALLATION & OPERATION MANUAL



www.heatredefined.com
Parts (800) 516-3636
Questions (800) 245-6489



Rev 5/2020

Manufactured By: England's Stove Works, Inc. PO Box 206 Monroe, VA 24574

CAUTION

Please read this entire manual before installation and use of this wood fuel- burning appliance. Keep children, furniture, fixtures and all combustibles away from any heating appliance.

SAVE THESE INSTRUCTIONS

SAFETY NOTICE

Failure to follow these instructions can result in property damage, bodily injury or even death. For your safety and protection, follow the installation instructions outlined in this manual. Contact your local building or fire officials about restrictions and installation inspection requirements (including permits) in your area.

THIS WOOD HEATER NEEDS PERIODIC INSPECTION AND REPAIR FOR PROPER OPERATION. CONSULT THE OWNER'S MANUAL FOR FURTHER INFORMATION. IT IS AGAINST FEDERAL REGULATIONS TO OPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITH THE OPERATING INSTRUCTIONS IN THE OWNER'S MANUAL.

IMPORTANT: IF YOU HAVE A PROBLEM WITH THIS UNIT, DO NOT RETURN IT TO THE DEALER. CONTACT TECHNICAL SUPPORT @ 1-800-245-6489

Mobile Home Use:

This freestanding wood unit is approved for mobile home or doublewide installation with the outside combustion air hook-up. See the "Installation" section of this manual for details pertaining to mobile home installations. Mobile home installation must be in accordance with the Manufactured Home and Safety Standard (HUD), CFR 3280, Part 24.

Retain for your files

Model Number _____

Date of Purchase _____

Date of Manufacture _____

Serial Number _____

* This information can be found on the safety tag attached to the rear of the unit. Have this information on hand if you phone the factory or your dealer regarding this product.

CAUTION

- Keep children away.
- Supervise children in the same room as this appliance.
- Alert children and adults to the hazards of high temperatures.
- Do NOT operate with protective barriers open or removed.
- Hot while in operation! Keep clothing, furniture, draperies and other combustibles away. Contact may cause skin burns!
- **Do NOT over-fire your unit.**
- Installation MUST comply with local, regional, state and national codes and regulations.
- Consult local building, fire officials or authorities having jurisdiction about restrictions, installation inspection, and permits.

WELCOME!

Introduction

- Thank You 4

Specifications

- Heating Specifications..... 5
- Dimensions..... 5
- EPA Compliance 5

Installation

- Installation Overview 6
- Clearances to Combustibles..... 7
- Venting Introduction..... 8
- Venting Guidelines..... 8
- Additional Venting Information ... 9
- Wall Pass-Throughs..... 10
- Approved Venting Methods
 - Through the Wall 11
 - Through the Ceiling..... 12
 - Masonry Chimney..... 13
 - Masonry Fireplace..... 14
- Mobile Home Installation 15
- Outside Air Hook-Up 15
- Floor Protection 16

Operation

- Break-In Fires 17
- Continuous Operation..... 17-18
- Safety Notes 19-20

Maintenance

- Stove Maintenance 21

- Inspecting Gaskets..... 22
- Finish 22

Replacing Components

- Glass 23
- Burner Tubes 24
- Ceramic Fiberboard..... 24
- Heat Shield 24
- Blower 25

Optional Accessories

- AC-16/AC-30 Blower 25

Important Information

- EPA and Safety Info 26

Troubleshooting Guide

- Troubleshooting..... 31

Illustrated Parts Detail

- Parts List..... 32
- Brick Layout 33

Warranty

- Sample Tag..... 34
- Warranty Details 35
- Important Notice 36
- Warranty registration Form 37

IMPORTANT NOTES: CLEARANCES MAY ONLY BE REDUCED BY MEANS APPROVED BY THE REGULATORY AUTHORITY HAVING JURISDICTION

DO NOT CONNECT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTHA OR ENGINE OIL. DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.

INTRODUCTION

Thank you for purchasing this fine product from England's Stove Works! England's Stove Works was started, and is still owned by, a family that believes strongly in a "Do It Yourself" spirit; that's one reason you found this product at your favorite "Do It Yourself" store.

We intentionally design and build our stoves so that any homeowner can maintain their unit with basic tools, and we're always more than happy to show you how to do the job as easily and as inexpensively as possible. However, while remaining simple, our stoves are designed to perform extremely efficiently, helping deliver more heat from less fuel.

Please look at our vast Help section on our website and call our Technical Support Department at (800) 245-6489 if you need any help with your unit. We are nearly always able to "walk you through" any installation issues, repairs, problems or other questions that you may have.

Wishing you years of efficient, quality and "comfy" heating,

EVERYONE AT ENGLAND'S STOVE WORKS

Please Note: While information obtained from our web site and through our Technical Support line is always free of charge, there will be a service charge incurred with any "on-site" repairs or maintenance that we may arrange.

This manual is available for free download on the manufacturer's web site. It is a copyrighted document and resale is strictly prohibited. The manufacturer may update this manual occasionally and cannot be responsible for problems including injuries or damages resulting from the use of information found in any manual from unauthorized sources.
PLEASE NOTE: If you purchased this model from certain stores, their model number may end in "L" "LC" "H" "CT", etc. This manual does apply to those models as well.

CAUTION: Stove is heavy.

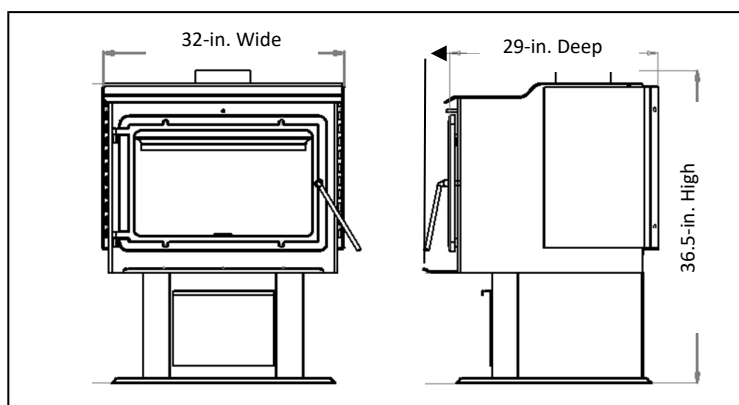
In addition, when handling any sheet metal products, be aware that there may be sharp edges or burrs. Although we make every effort to eliminate any sharp edges, please use caution when handling any metal parts. Remember to disconnect (unplug) the stove from the power source and allow it to completely cool down before performing any maintenance.

SPECIFICATIONS

Heating Specifications

- Maximum Burn Time** Up to 14 hours
- Approximate Square Footage Heated*** 2,400 sq. ft.
- Flue Collar 6.0 in. round

Dimensions (Inches)



EPA and Safety Compliance Specifications

- **EPA Compliance Status** Certified to comply with 2020 particulate emission standards using cord wood.
- U.S. Test Standard: US EPA 40 CFR Part 60, Subpart 60.536
- Particulate Emissions 1.8 grams/hr
- CO Emissions 1.9 grams/min
- Heat Output Range 17500 – 65900 Btu/hr
- Efficiency* 72% HHV
- Tested To EPA Test Method 28R, ASTM E3053-17, EPA Alt 125, CSA B415.1-10

Dimensions are approximate. Be sure to locate your stove in the installation area before installing pipe, etc.

** - Maximum burn times are heavily dependent on the type of wood burned in the stove; as such, these numbers may vary.

*** - The maximum heating capacity of this unit can vary greatly based on climate, construction style, insulation and a myriad of other factors. Use this information in conjunction with a BTU loss calculation for your home to determine if this unit will be sufficient for your needs.

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

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

INSTALLATION

Installation Overview

When choosing a location for your new stove, there are a multitude of factors that should be taken into account before beginning the installation.

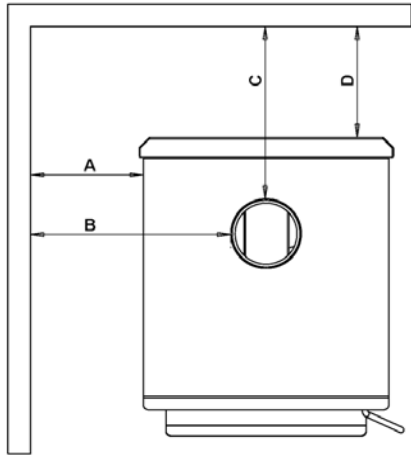
1. Traffic Patterns – To help prevent accidents, the stove should be placed in a location where it is out of the way of normal travel through the home.
2. Heat Flow and Efficiency – When deciding on a location for the stove, consider the way heat moves throughout your home. Install the stove where you need the heat; basement installations often do not allow sufficient heat to flow to the upper floors and a top floor installation will not allow any heat to reach the floors below. Always consider that heat rises and will take the path of least resistance while it is still hot.
3. Exhaust Location – The engine which drives a wood stove is the chimney system, so it is important to consider precisely how the chimney system will be integrated into the stove installation. Ideally, a wood stove chimney will run completely vertical from the flue collar of the unit all the way to the termination point above the roof line. Keeping the entire chimney system inside the heated envelope of the home will ensure a strong, easy to initiate draft in the chimney. Although exterior chimney systems often function properly, they are more likely to suffer from cold down drafts at start up or provide weak draft to the unit. Also, consider the cross-sectional area of the chimney; although existing masonry chimneys can often be used, a large external masonry chimney will result in a unit that is difficult or impossible to operate properly. In that case, an insulated chimney liner will often be required to supply the necessary draft.
4. Wall Construction – Locating the stove so that the exhaust system can pass between studs will simplify the installation and eliminate the need to reframe any sections of the wall or ceiling to accommodate the wall thimble or ceiling box.

WARNING

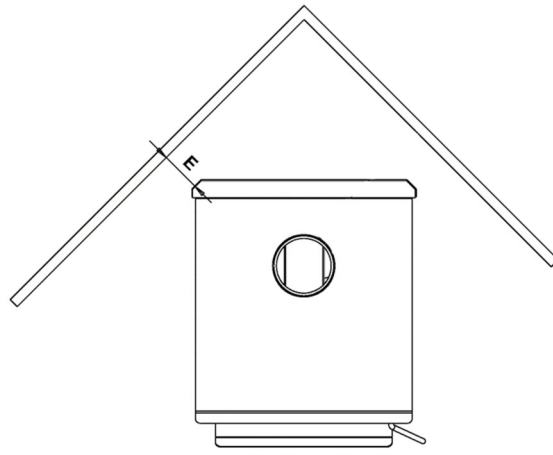
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do Not Over-fire – If any external part starts to glow, you are over-firing. Reduce intake air supply. Over-firing will void your warranty.
- Comply with all minimum clearances to combustibles as specified. Failure to comply may result in a house fire.
- Tested and approved for **cordwood only**. Burning any other fuel will void your warranty.

INSTALLATION

Clearances to Combustibles



*Parallel
Wall Installation*



Corner Installation

WARNING - INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER

	Unit to Side Wall *	Chimney Connector to Side Wall	Chimney Connector to Rear Wall	Unit to Rear Wall	Unit to Corner	Chimney Connector to Corner
	A	B	C	D	E	F
	in. (mm.)	in. (mm.)	in. (mm.)	in. (mm.)	in. (mm.)	in. (mm.)
Single Wall Chimney Connector Unprotected Surface	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Double Wall Chimney Connector Unprotected Surface	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Single Wall Chimney Connector Unprotected Surface with side shields.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Double Wall Chimney Connector Unprotected Surface with side shields.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Notes for this unit: The product may differ slightly from the diagrams. The clearances are the minimum for this unit and may need to be increased to have proper ventilation clearances. Observe all ventilation manufacturer clearances and local codes.

INSTALLATION

Venting Introduction

This wood stove operates on a natural draft system, in which the chimney system pulls air through the stove. This unit must be installed in accordance with the following detailed descriptions of venting techniques; not installing the stove in accordance with the details listed here can result in poor stove performance, property damage, bodily injury or death. Avoid make-shift compromises when installing the venting system. England's Stove Works is not responsible for any damage incurred due to a poor or unsafe installation.

Be certain that all aspects of the venting system are installed to the venting manufacturer's instructions, particularly the required clearances to combustibles. Also, be certain to use an attic radiation shield to prevent insulation from contacting a chimney which passes through an attic.

The chimney system is the "engine" which drives a wood stove, so it is imperative for proper unit function that the venting system be installed exactly as described in the following section.

If questions arise pertaining to the safe installation of the stove, our Technical Support line (800-245-6489) is available. Contact your local code official to be certain your installation meets local and national fire codes, and if you're uncertain about how to safely install the stove, we strongly recommend contacting a local NFI certified installer to perform the installation.

Venting Guidelines

- **ALWAYS** install vent pipe in strict adherence to the instructions and clearances included with your venting system.
- **DO NOT** connect this wood stove to a chimney flue which also serves another appliance.
- **DO NOT** install a flue pipe damper or any other restrictive device in the exhaust venting system of this unit.
- **USE** an approved wall thimble when passing and a ceiling support/fire stop when passing through a ceiling.
- **INSTALL** three sheet metal screws at every chimney connector joint.
- **AVOID** excessive horizontal runs and elbows, as both will reduce the draft of the venting system and will result in poor stove performance.
- **INSPECT** your venting system often, to be certain it is clear of creosote, fly-ash and other restrictions.
- **CLEAN** the venting system as detailed in the maintenance section of this manual.
- **ADHERE** to the 10-3-2 rule regarding chimney terminations.
- **INSTALL** single wall chimney connector with the male end **down** to prevent creosote leakage. Follow double wall chimney connector manufacturer's instructions regarding proper pipe installation.

Where passage through a wall or partition of combustible construction is desired, the installation shall conform with CAN/CSA-B365.

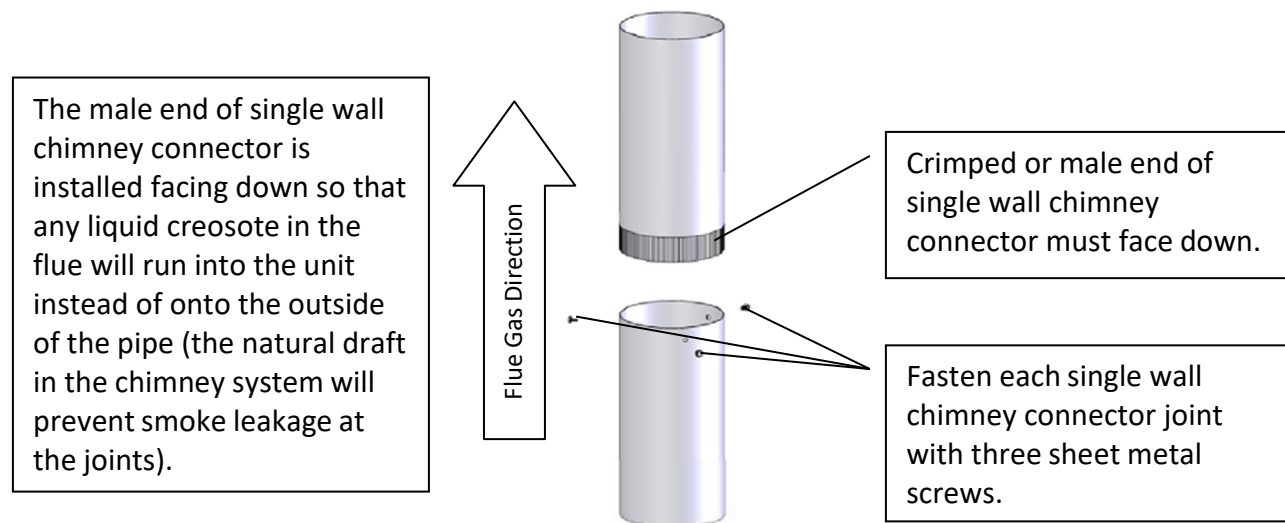
WARNING: Venting system surfaces get HOT, and can cause burns if touched. Noncombustible shielding or guards may be required.

INSTALLATION

Additional Venting Information

- Do not mix and match components from different pipe manufacturers when assembling your venting system (i.e. Do **NOT** use venting pipe from one manufacturer and a thimble from another).
- We **require** a minimum chimney height of 15.0 ft. Chimney systems shorter than this may not create the amount of draft which is required to operate this wood burning unit.
- Do not use makeshift compromises when installing the venting system; have existing chimney systems inspected before use and be certain all new chimney systems are installed to the manufacturer's specifications and with only UL listed components (ULC if Canada).
- Prefabricated venting systems used for this stove must be listed to ULC S629 (Canada) and UL 103HT (US).
- Never install a draft inducer or any other system which increases the natural draft of the chimney; similarly, do not install a barometric or stovepipe damper with this unit.
- Never use single wall or double chimney connector as a chimney system; never pass either type of chimney connector through a combustible wall without carefully following the manufacturer's instructions and those listed in the following page on Wall Pass-Throughs. NEVER pass chimney connector through an attic, floor, closet or roof.
- Only use 24 gauge MSG black single wall chimney connector or UL Listed (ULC if Canada) double wall chimney connector.

Single Wall Chimney Connector Installation



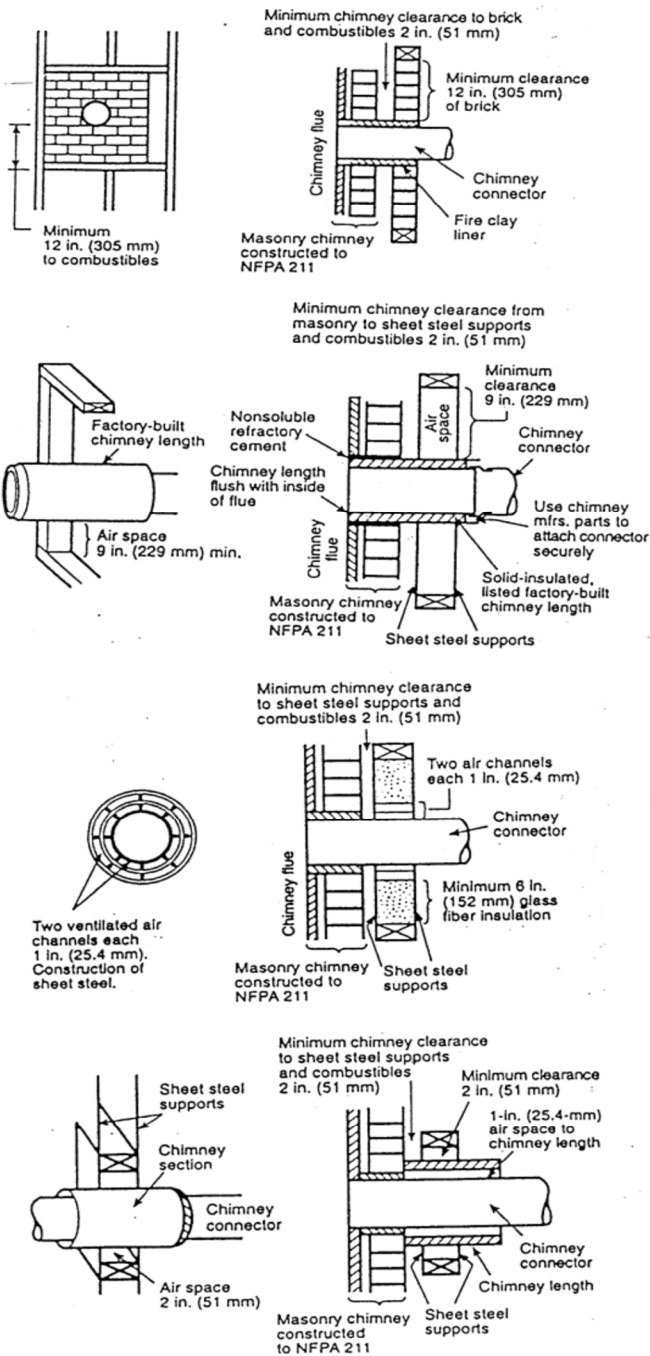
WARNING

- INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.
- HOT! Do not touch! Severe burns or clothing ignition may result.
- Glass and other surfaces are hot during operation.

INSTALLATION

Wall Pass-Throughs

Chimney Connector Systems and Clearances from Combustible Walls for Residential Heating Appliances



A Minimum 3.5-in thick brick masonry all framed into combustible wall with a minimum of 12-in brick separation from clay liner to combustibles. The fireclay liner shall run from outer surface of brick wall to, but not beyond, the inner surface of chimney flue liner and shall be firmly cemented in place.

B Solid-insulated, listed factory-built chimney length of the same inside diameter as the chimney connector and having 1-in. or more of insulation with a minimum 9-in. air space between the outer wall of the chimney length and combustibles.

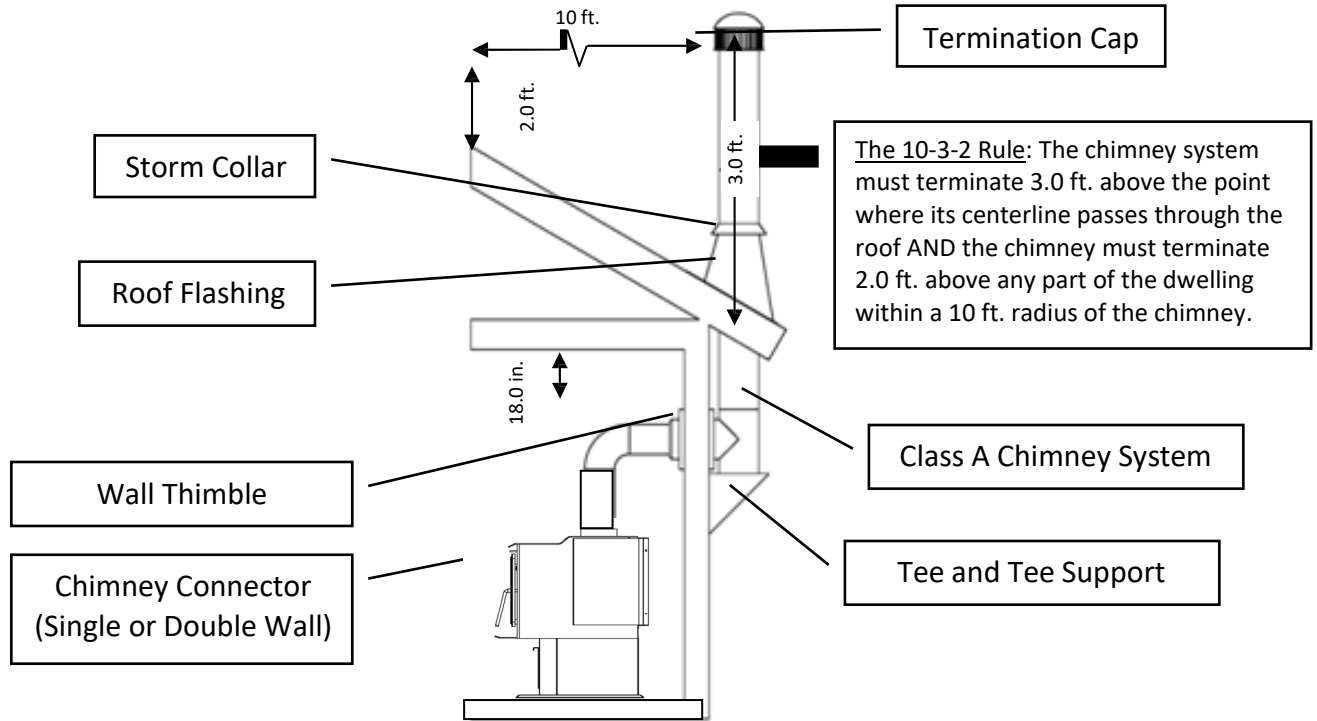
C Sheet steel chimney connector, minimum 24 gauge in thickness, with a ventilated thimble, minimum 24 gauge in thickness, having two 1-in. air channels, separated from combustibles by a minimum of 6-in. of glass fiber insulation. Opening shall be covered, and thimble supported with a sheet steel support, minimum 24 gauge in thickness.

D Solid insulated, listed factory-built chimney length with an inside diameter 2-in. larger than the chimney connector and having 1-in. or more of insulation, serving as a pass-through for a single wall sheet steel chimney connector of minimum 24 gauge thickness, with a minimum 2-in. air space between the outer wall of chimney section and combustibles. Minimum length of chimney section shall be 12-in. chimney section spaced 1-in. away from connector using sheet steel support plates on both ends of chimney section. Opening shall be covered, and chimney section supported on both sides with sheet steel supports securely fastened to wall surfaces of minimum 24 gauge thickness. Fasteners used to secure chimney section shall not penetrate chimney flue liner.

In Canada, the installation must conform to CAN/CSA-8365 when passing through combustible construction.

INSTALLATION

Approved Venting Method 1: Through the Wall Factory Built Chimney

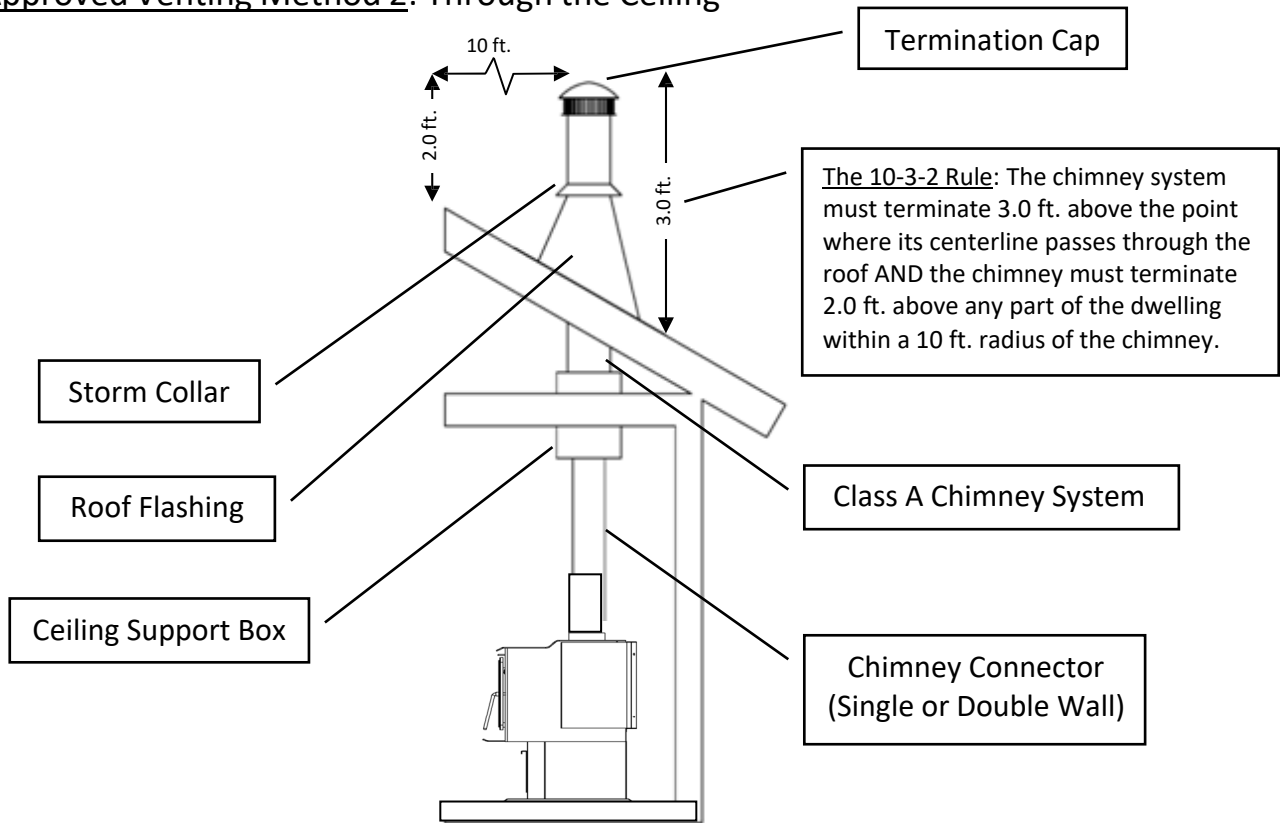


- Prefabricated chimney systems must conform to UL-103HT (2100 °F) for the U.S. and ULC-S629 (650°C) for Canada.
- This wood burning unit is only listed for installation with 6.0" diameter chimney connector and chimney systems. Installing this unit on prefabricated chimneys larger than 6.0" diameter will result in decreased draft and the potential for poor unit performance.
- Follow all venting system manufacturer's installation requirements and required clearances.
- Use three sheet metal screws at each single wall chimney connector joint (check manufacturer's recommendations when double wall chimney connector is used).
- Drill three holes in the flue collar of the unit and attach the chimney connector to the unit using sheet metal screws (holes should be pre-drilled in flue collar from factory).
- Properly attach the prefabricated chimney system to the home in strict accordance with the prefabricated chimney system manufacturer's instructions.
- Avoid numerous elbows and excessive horizontal runs as both will lead to poor draft and increased creosote accumulation. Horizontal runs of chimney connector must never exceed 4.0 ft. and the overall length of the chimney connector must not exceed 8.0 ft.
- Special adapters and slip connectors are available to eliminate the need to cut single wall chimney connector. Double wall chimney connector must be used with these slip connectors, as it cannot be trimmed to length.

Please Note: Installation diagrams are for reference purposes only and are not drawn to scale, nor meant to be used as plans for each individual installation. Please follow all venting system requirements, maintain the required clearances to combustibles, and follow all local codes.

INSTALLATION

Approved Venting Method 2: Through the Ceiling

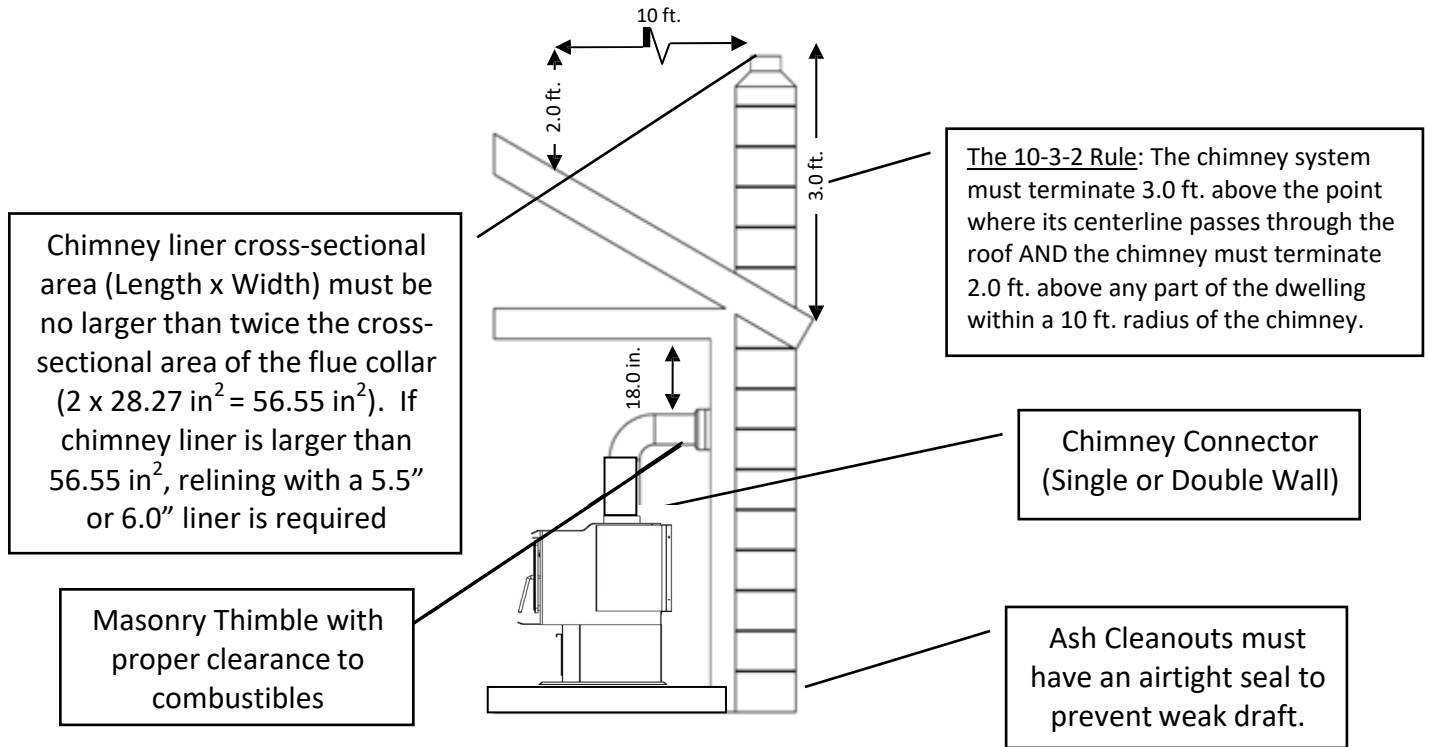


- Prefabricated chimney systems must conform to UL-103HT (2100 °F) for the U.S. and ULC-S629 (650°C) for Canada.
- This wood burning unit is only listed for installation with 6.0" diameter chimney connector and chimney systems. Installing this unit on prefabricated chimneys larger than 6.0" diameter will result in decreased draft and the potential for poor unit performance.
- Follow all venting system manufacturer's installation requirements and required clearances.
- Use three sheet metal screws at each single wall chimney connector joint (check manufacturer's recommendations when double wall chimney connector is used).
- Drill three holes in the flue collar of the unit and attach the chimney connector to the unit using sheet metal screws (holes should be pre-drilled in flue collar from factory).
- Properly attach the prefabricated chimney system to the home in strict accordance with the prefabricated chimney system manufacturer's instructions.
- The overall length of the chimney connector must not exceed 8.0 ft. In the case of cathedral ceilings, the prefabricated chimney system should extend to 8.0 ft. from the top of the unit.
- Special adapters and slip connectors are available to eliminate the need to cut single wall chimney connector. Double wall chimney connector must be used with these slip connectors, as it cannot be trimmed to length.

Please Note: Installation diagrams are for reference purposes only and are not drawn to scale, nor meant to be used as plans for each individual installation. Please follow all venting system requirements, maintain the required clearances to combustibles, and follow all local codes

INSTALLATION

Approved Venting Method 3: Internal or External Masonry Chimney System



- Follow the rules listed above concerning maximum permissible flue liner size; installing this unit on masonry chimneys exceeding 56.55 in^2 in cross-sectional area will result in decreased draft and the potential for poor unit performance.
- Use three sheet metal screws at each single wall chimney connector joint (check manufacturer's recommendations when double wall chimney connector is used).
- Drill three holes in the flue collar of the unit and attach the chimney connector to the unit using sheet metal screws (holes should be pre-drilled in flue collar from factory).
- Avoid numerous elbows and excessive horizontal runs as both will lead to poor draft and increased creosote accumulation. Horizontal runs of chimney connector must never exceed 4.0 ft. and the overall length of the chimney connector must not exceed 8.0 ft.
- A tight seal at the thimble is crucial for proper unit performance and to create a safe installation. Use the proper adapter designed for connecting single or double wall chimney connector to a masonry thimble.
- Have existing masonry chimneys inspected for safety and proper clearances to combustibles before putting them into service; a qualified chimney sweep can perform this inspection.
- External masonry chimneys often suffer cold downdrafts and poor draft performance even when they meet the cross-sectional area rules. In this case, a 6.0" insulated liner may be necessary.

Please Note: Installation diagrams are for reference purposes only and are not drawn to scale, nor meant to be used as plans for each individual installation. Please follow all venting system requirements, maintain the required clearances to combustibles, and follow all local codes.

INSTALLATION

INSTALLATION INTO A MASONRY FIREPLACE

Preparation

Measure your hearth to ensure it is large enough to accept the unit.

Unit must have a 36" clearance from the top of the stove to a mantel in accordance with NFPA 211

For the USA: Hearth must extend at least 16 in. from the front of the fuel opening.

For Canada: Hearth must extend at least 18 in (450.0 mm) from the front of the fuel opening.

Keep in mind that this type of a installation will make it difficult to change speeds on the blower frequently. We recommend picking a blower speed and sticking with it, since adjusting the blower will be difficult because of the tight installation.

WARNING: DO NOT ATTEMPT TO ADJUST BLOWER DURING OPERATION. SKIN BURNS MAY OCCUR WHEN MAKING CONTACT WITH THE UNIT. WAIT FOR UNIT TO COMPLETELY COOL BEFORE ATTEMPTING TO ADJUST BLOWER.

Inspect your hearth to be sure it is constructed of a noncombustible material such as brick or stone. Do **not** install this stove on a hearth that is constructed of wood framework that is covered by brick or stone and do **not** install this unit in a zero (0) clearance fireplace. The manufacturer will not be held responsible for an accident resulting from this stove being installed on a hearth constructed of a combustible material.

Inspect your fireplace to ensure it is in proper working order and free of any obstructions.

Prior to installation, remove the existing damper or wire it to fasten it open.

Venting Your Stove - Direct Connect

When this unit is direct connected it will require six inch (6") diameter 24 gauge pipe from the stove through the damper opening. **(NOTE: The chimney connector must be attached to the appliance with a minimum of three (3) screws, and 3 screws should be used to attach each adjoining section.)**

We highly recommend having the chimney fully lined with a 6 inch liner to ensure proper draft. This will make it necessary to block off the open area on both sides of the pipe that passes through the damper opening, which can be done with sheet metal or by packing flame retardant fiberglass insulation in the open areas (no paper or combustibles). You must be sure the draft from the chimney is being pulled through the stove, and not around the connector pipe. .

We highly recommend you have this done by a professional. You should also contact your local authorities to be sure you are following all codes.

INSTALLATION

WARNING

DO NOT INSTALL IN A SLEEPING ROOM.

CAUTION

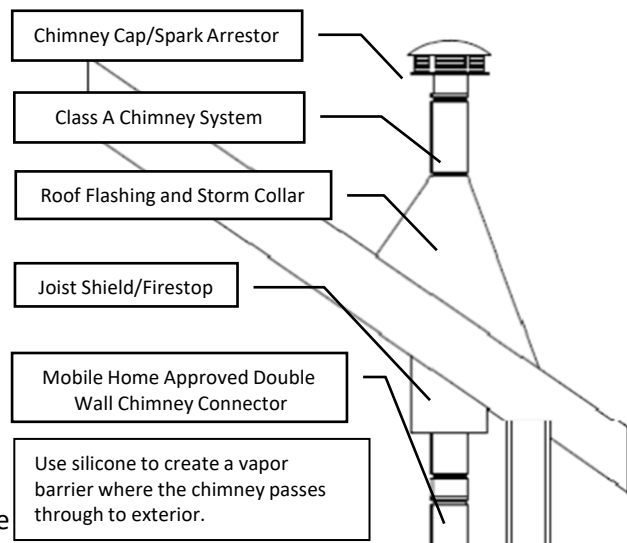
THE STRUCTURAL INTEGRITY OF THE MANUFACTURED HOME FLOOR, WALL AND CEILING/ROOF MUST BE MAINTAINED.

Caution

NEVER draw outside combustion air from: Wall, floor or ceiling cavity or enclosed space such as an attic, garage or crawl space.

Mobile Home Installation

- The wood stove **MUST** be secured to the floor of the mobile home using lag bolts and the holes provided in the bottom of the unit for this purpose. Outdoor-aired space heaters must be attached to the structure. Use a #8 copper wire to ground stove to frame of mobile home.
- The wood stove must be connected to the chimney system with double wall chimney connector which is UL listed for use in mobile and manufactured homes.
- Carefully follow all clearances listed in the appropriate section of this manual AND follow the venting manufacturer's minimum clearance requirements. Similarly, be certain the venting system used is approved for mobile home use.
- Installation must be in accordance with Manufacturers Home & Safety Standard (HUD) CFR 3280, Part 24 as well as any applicable local codes.

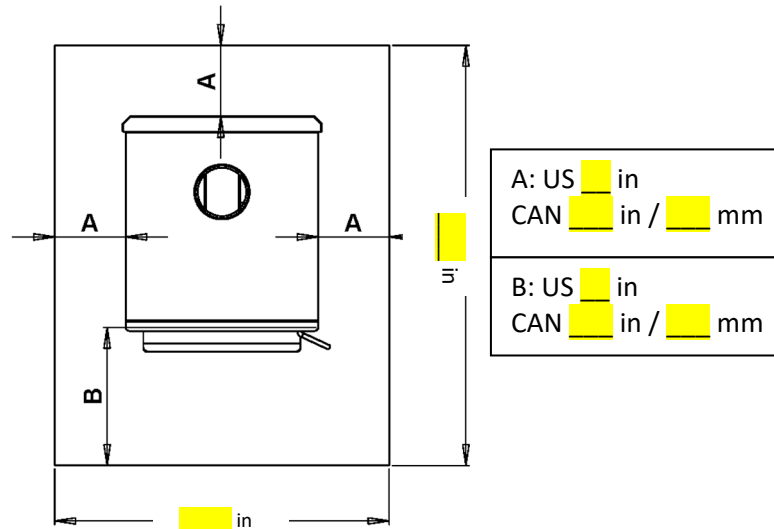


Outside Combustion Air

- The use of outside combustion air is **mandatory** when installing this wood stove in a mobile or manufactured home.
- The outside air connection pipe protrudes from the bottom center of the stove; a kit is available from England's Stove Works, Inc. designed for connecting this unit to outside combustion air. [Part No. AC-OAK3]
- If it is not feasible to use the AC-OAK3 outside air hookup kit in your stove installation, other materials may be used, provided the following rules are followed:
 - The pipe used for outside air hookup must be metal, with a minimum thickness of .0209in. (25 gauge mild steel) or greater and an inside diameter of approximately 2.75 in.
 - Keep pipe runs short and use a mechanical fastener at each pipe joint.
 - A screen or other protection device must be fitted over the outside air termination point to prevent rain, debris and nuisance animals from entering the piping system. Inspect the outside combustion air inlet for block and debris monthly.

FLOOR PROTECTION

- This wood stove requires a U.L. listed (ULC if Canada) floor protector with a R factor of no less than [redacted], if the stove is to be installed on a combustible floor. If the floor the stove is to be installed on is already non-combustible (i.e. a concrete floor in a basement), no floor protection is needed (although a decorative floor protector can still be used for aesthetic reasons).
- When using any floor protector, consider that this stove is not only heavy but will induce heating and cooling cycles on the floor protector which can damage tile and loosen mortar and grout joints located near the stove.
- The floor protector should be UL approved or equivalent (ULC if Canada) and must be noncombustible. A hearth rug is NOT an approved substitute for a proper hearth pad.
- For the US: The floor protector must extend at least [redacted] in. from the front of the fuel opening, [redacted] in. from the sides of the door opening and [redacted] in. from the rear of the unit.
- For Canada: The floor protector must extend at least [redacted] mm from the front of the fuel opening, [redacted] mm from the sides of the door opening and [redacted] mm from the rear of the unit.



- The floor protector must extend 2 in. (50.8 mm.) on either side of any horizontal venting runs and extend directly underneath any vertical venting pipe.

CAUTION

NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR "FRESHEN UP" A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER WHILE IN USE. ADDITIONALLY, NEVER APPLY FIRE-STARTER TO ANY HOT SURFACE OR EMBERS IN THE STOVE.

OPERATION

Break-In Fires

- This wood burning unit is constructed of heavy gauge steel and cast iron and is built to last a long time. However, in order to ensure no excessive thermal stresses are induced on the metal during the first fire, three break-in fires should be burned, each one slightly hotter than the last. These break-in fires will not only help the stove body acclimate to the high temperatures of the fire, but will also slowly cure the high temperature stove paint, which will ensure the high quality finish lasts for years.
 - WE HIGHLY RECOMMEND burning your break-in fires outdoors, as the paint and manufacturing oils will ‘burn off’ the stove exterior somewhat during this time. If you do burn them indoors with your flue system, open doors and windows to ventilate.
- This stove has a single air control rod which regulates the wood burn rate; when the primary air control slide is pushed all the way into the unit, the stove will burn more slowly and put out heat over a longer time period. Conversely, when the air control slide is pulled all the way out, the unit will burn more quickly and put out a larger amount of heat over a relatively shorter time period. Do not attempt to modify the range of air control adjustment for any reason.
- The first break-in fire should be just a large kindling fire, getting the stove to about 300°F as measured by a magnetic thermometer on the right or left side of the stove, above the door. Once this temperature has been reached, allow the fire to die out with the air control open. The second and third break-in fires should be a bit larger, with some small dry splits added to the kindling load. The temperature goal during these fires is about 350°F – 450°F; don’t let the fire get hotter than that.

Continuous Operation – Daily Operation after your Break-In Fires

Start-up

- Load the firebox with wood, split to moderate size.
- On top of the startup wood, add dry kindling split into very small pieces.
- Ignite the kindling from the top until a flame is established.
- Close the door and set the damper to High (fully open) to reduce the amount of smoke.

High Burn

- Be sure the dog box is not covered with ashes or coals (see Brick Layout, page 33, for dog box location).
- Load wood load onto the coal bed after chopping and packing coals, if necessary.
- Close the door, set the damper to High (fully open) and set blower to High speed.

Low Burn

- Be sure the dog box is not covered with ashes or coals (see Brick Layout, page 33, for dog box location).
- Load wood load onto the coal bed after chopping and packing coals, if necessary.
- Close the door, set the damper to High and set blower to High speed.
- After 15 minutes, set the damper to Low (fully closed) and set blower to Low speed.

Medium Burn

- Be sure the dog box is not covered with ashes or coals (see Brick Layout, page 33, for dog box location).
- Load wood load onto the coal bed after chopping and packing coals, if necessary.
- Close the door, set the damper to ½ closed and set blower to High speed.
- After 15 minutes, set the blower to Low speed.

OPERATION

- England’s Stove Works, Inc. always recommends the use of a magnetic stove thermometer, so that the temperature of the unit can be monitored. When using a magnetic stove thermometer, locate the thermometer above the door on either the left or right side of the stove and use the following temperatures as rough guidelines to determine the burn rate and heat output level of the stove:
 - Normal wood stove operation should occur between 350°F (177°C) and 550°F (288°C), with 350°F (177°C) to 450°F (232°C) being a low to medium heat output level and 450°F (232°C) to 550°F (288°C) being a medium to high heat output level. Operating the stove at 600°F (316°C) would be considered the maximum continuous operating temperature permissible and unit damage may result from operating at that high of a burn rate for extended time periods. Allowing the unit to reach 750°F (398°C) or higher is defined as over-firing and will result in unit damage.
- The optional room air convection blower was designed to extract the maximum amount of heat from the stove, for the highest possible heat transfer into the room. Since the blower is so efficient at removing heat from the unit, it is very important to only operate the room air blower after a fresh wood load has been allowed to burn for at least thirty (30) minutes. Allowing a fresh load of wood to burn without the blower on ensures that the entire unit reaches proper operation temperatures and that the secondary combustion system is functioning properly. Additionally, follow the guidelines below for acceptable blower speeds.
- When using the optional room air convection blower (Part No. AC-16, or you can upgrade to the AC-30), the blower should be operated as follows depending on heat output level:

Burn Rate	High	Medium High	Medium	Medium Low	Low
Blower Speed AC-16	High	High	Low	Low	Low
Blower Speed AC-30	High	Medium High	Medium	Medium Low	Low

Creosote – Formation and Need for Removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool 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 and chimney connector should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of chimney fire.

DO NOT USE GRATES OR ANDIRONS OR OTHERWISE ELEVATE FIRE – BUILD WOOD FIRE DIRECTLY ON HEARTH
DO NOT OPERATE WITH THE MAIN DOOR OPEN – OPERATING THE STOVE WITH THE MAIN DOOR OPEN WILL CREATE AN OVER-FIRE

In the event of a creosote or soot fire (chimney fire), close the air control on the stove, contact the local fire department and get out! Do not throw water on the fire! Contact your local fire authority for more information on how to handle a chimney fire and develop a safe evacuation plan for you and your family in the event of a chimney fire.

DO NOT STORE FUEL CLOSER THAN SPECIFIED CLEARANCES TO COMBUSTIBLES OR WITHIN THE SPACE NEEDED FOR LOADING THE STOVE AND FOR ASH REMOVAL.

OPERATION

Additional Safety Guidelines

CAUTION: When adding fuel to the stove, the blower must be turned OFF.

- The installation of smoke detectors is highly recommended when installing this or any other solid fuel burning appliance. Smoke detectors should be located near or in every room of the home, particularly sleeping rooms.
- A smoke detector can be installed in the same room as this cordwood burning unit; installing the smoke detector too close to the unit can lead to nuisance alarms due to slight wisps of smoke emitted during the fire starting or reloading process. Due to this, the smoke detector in the same room as the unit will be most useful if it is located as far from the unit as the room will permit.
- This stove is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried, seasoned hardwoods, as compared to soft woods or to green or freshly-cut hardwoods. **DO NOT BURN garbage, lawn clippings or yard waste, materials containing rubber, including tires; Materials containing plastic: Waster 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 previously salt water saturated materials; Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater. Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.**
- Burning fuels other than cordwood, particularly coal and charcoal, can result in hazardous concentrations of carbon monoxide being emitted into the dwelling. For these reasons, NEVER burn coal or charcoal in this cordwood stove. Installing a carbon monoxide detector and being aware of the symptoms of carbon monoxide poisoning can help reduce the risk of carbon monoxide related issues.
- This unit was designed for operation only with the loading door closed and tightly latched. Operating this unit with the loading door latched loosely or open will allow excessive combustion air to reach the fire and will result in dangerously high unit temperatures. High unit temperatures can damage the unit, void the warranty or ignite creosote deposited in the chimney system by previous, slow burning fires.
- The natural draft that pulls air through this unit and allows the fire to burn uses the indoor air of the dwelling for combustion, unless the unit is connected to an outside combustion air source. Kitchen range vent hoods, furnaces and other air movement appliances in the home are often also removing air from the dwelling; if the amount of air filtration or leakage back into the home is exceeded by the air being removed, negative pressure may be created in the home.
- Since this is a natural draft appliance, it will often be the first appliance to have problems related to negative pressure. If smoke is forced out the chimney connector joints or out of the air induction system of the unit, the unit is likely fighting negative pressure in the dwelling. Cracking a window or door near the appliance can help equalize the negative pressure;

ultimately, an unrestricted source of outside combustion may be necessary for proper unit function.

- If the unit is connected to outside air, be certain to monitor the exterior inlet to the combustion system for icing or snow accumulation. Allowing the outside air connection to become restricted will result in air starvation to the unit.

Safe Wood-Burning Practices

Once your wood-burning appliance is properly installed, follow these guidelines for safe operation:

- Keep all flammable household items—drapes, furniture, newspapers, and books—far away from the appliance.

Start fires only with newspaper, dry kindling and all natural or organic fire starters. Never start a fire with gasoline, kerosene, or charcoal starter.

Do not burn wet or green (unseasoned) logs.

Do not use logs made from wax and sawdust in your wood stove—they are made for open hearth fireplaces. If you use manufactured logs, choose from those made from 100 percent compressed saw dust.

Build hot fires. For most appliances, a smoldering fire is not a safe or efficient fire.

Keep the doors to your wood-burning appliance closed unless loading or stoking the live fire. Harmful chemicals, like carbon monoxide, can be released into your home.

Regularly remove ashes from your wood-burning appliance into a metal container with a cover. Store the container of ashes outdoors on a cement or brick slab (not on a wood deck or near wood). See ash removal instructions in your owner's manual.

Keep a fire extinguisher handy.

Remember to check your local air quality forecast before you burn.

MAINTENANCE

Daily Maintenance

- Inspect the firebox for ash accumulation; remove excess ash and follow instructions below regarding disposal. Ash should not be allowed to accumulate in the stove to the point that it covers the dog box hole (see Brick Layout, page 33, for dog box location).

Monthly Maintenance

- Check the blower for dust accumulation (if installed); check the door handle for proper operation and to be certain an airtight seal is still being made by the door.
- Inspect the chimney system and chimney connector and sweep if necessary. Although cleaning may be required less than monthly, ALWAYS inspect the venting system monthly to decrease the chance of a chimney fire.
- Visually inspect the ceramic fiber insulating boards in the firebox for cracks and/or breakage. Slight surface cracks will not affect the performance of the boards, but cracked or crumbling boards should be replaced immediately.
- Visually inspect the secondary combustion tubes for cracks, warping and corrosion. Although these tubes are constructed from stainless steel, they operate at very high temperatures and can eventually wear out from normal use.

Yearly Maintenance

- Check all gaskets (window and door) for wear and to be certain they still maintain an airtight seal. See the following page for instructions.
- Thoroughly clean the chimney system and the chimney connector system. Since the chimney connector is generally exposed to high exhaust temperatures, inspect it carefully for leaks and weak spots; replace any questionable pieces. [In the case of straight through the roof chimney system, be certain to remove the ceramic fiber baffles **before** pushing the chimney sweeping brush down into the firebox. Forcefully hitting the top of the baffle with a cleaning brush or rod can damage or destroy the baffle.]
- Remove all ash from the stove, including the ash which accumulates on the top of the firebox baffles. Leave the air control open during the non-heating months to allow some air to flow through the stove to help prevent corrosion. A small open container of cat litter in the stove can help prevent corrosion during the humid summer months; be certain to remove it before building a fire in the fall.

IMPROPER GASKET MAINTENANCE, INCLUDING FAILURE TO REPLACE GASKETS, CAN CAUSE AIR LEAKS RESULTING IN AN UNCONTROLLABLE FIRE IN THE UNIT.

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

MAINTENANCE

Inspecting Gaskets

An airtight seal at the door opening is crucial to proper stove performance. Any air leakage at this area can cause an over-fire situation and is therefore a serious safety threat. Because of this, gaskets should always be maintained in good condition. Gasket tightness can be checked using the “dollar-bill” method:

- Place a dollar bill between the gasket and the stove body (at the location where the gasket meets the stove).
- Close and tighten the door then attempt to pull the dollar bill out. If the dollar bill slides in and out easily, the gasket needs to be replaced. This test should be repeated around the entire gasket perimeter, as gaskets will sometimes seal tightly on one side, but will be worn and seal poorly on another side.
- Perform this test around the entire perimeter of the door, and visually inspect the window gasket for any leaks. Leaks in the window gasket can generally be located by following the prevailing soot trails left on the window after burning the unit.
- If any area fails the test, the entire gasket should be replaced. The part number appropriate to the gasket being replaced can be found in the “Illustrated Parts” section of this manual.
- Gaskets should only be replaced with equivalent fiberglass gaskets purchased from England’s Stove Works® specifically for this unit.

Gaskets

1. Door - This unit comes with a ¾” rope gasket around the door that should be replaced at least every year. To replace the door gasket (Part # AC-DGKHD), the old gasket must first be removed entirely — prior to adding the new adhesive, you may have to scrape the old cement from the door channel. Once the cement and gasket have been added, the door should be closed and latched for twenty-four hours to allow the cement to harden.
2. Window - If you are replacing the window gasket (Part # AC-GGK), the new gasket will already have adhesive on one side. First, remove the old gasket. Next, remove the paper on the adhesive side and place the gasket around the outside edge of the glass, centered over the edge. Fold the gasket edges over on the glass, forming a “U” shape.

Finish

This new unit has been painted with High-Temperature Paint that should retain its original look for years. If the unit should get wet and rust spots appear, the spots can be sanded with fine steel wool and repainted. It is crucial that only High-Temperature Spray Paint is used (Part # AC-MBSP), as others may not adhere to the surface or withstand the high temperatures. Similarly, some brands of paint will not adhere to different brands of paint, so we highly recommend using our proprietary High-Temperature Spray Paint.

REPLACING COMPONENTS

Glass

This unit has a ceramic glass panel (Part No. AC-G51) in the viewing door; self adhesive glass gasket is included with replacement glass (purchase directly from England's Stove Works). Never replace ceramic glass with tempered or any other type of glass and never operate this unit with cracked or broken glass.

- Glass Size: 20.75 in. (527.05 mm) x 12.625 in. (320.67 mm)
- Glass Type: 5mm Ceramic Glass (Keralite Pyroceram)
- Glass Manufacturer: Eurokera

Glass Precautions

1. Never replace ceramic glass with tempered or any other type of glass.
2. Never operate this unit with cracked or broken glass.
3. Do not slam the door or strike the glass with any objects.
4. Do not build the fire directly against the glass.

Glass Cleaning

1. Be certain the stove **and** the glass are completely cool.
2. The build-up on the glass will generally be light and water is normally sufficient to remove the deposits. If stubborn soot persists, use a cleaner made specifically for this purpose. Do not scrape the glass or use abrasive cleaners.
3. Rinse the glass with clean water and dry the glass before resuming normal operation.

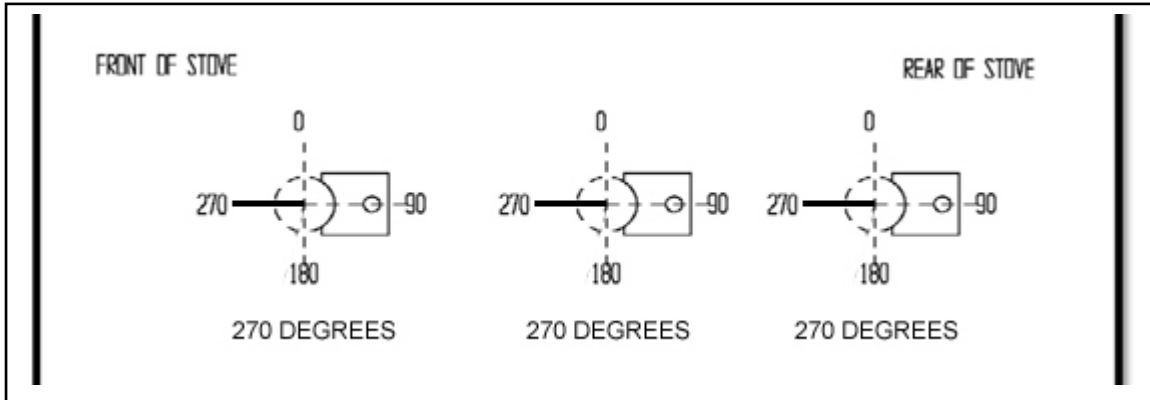
Glass Replacement

1. Remove the door from the stove and rest it face down on a firm work surface.
2. Using a 5/16" wrench, remove the four window bracket retaining screws.
3. Remove the four window tabs from the door. Take extra care to avoid shards of glass if the glass window has been broken.
4. Lift the old glass panel out of the door and discard.
5. The glass panel must be wrapped with a self-adhesive fiberglass tape gasket (AC-GGK). If you purchased a new glass, it will come already wrapped. If reusing the same piece of glass, remove old gasket, scrape off old adhesive and wrapped with the AC-GGK. This gasket serves to cushion the glass from the cast iron door.
6. Reinstall the window retaining tabs using the four screws previously removed. Do not over-tighten the screws.

REPLACING COMPONENTS

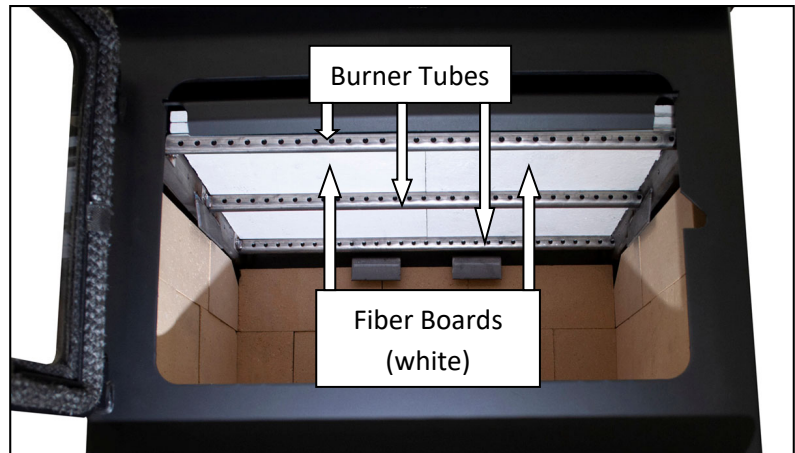
Burner tube replacement

There are three different burner tubes in the top of the stove. To replace a tube, first be sure that you order the correct tube you need to replace. Then using a 5/16" socket or open end wrench, remove the screw located on the left side of the tube. Be sure to keep the screw. Push the tube to the right then remove the tube (pulling the tube back to the left after that side has been removed from the hole). To replace, reverse the above procedure...make sure to install the tubes in the correct order. (Front to Back)



Ceramic fiberboard replacement

There are four fiber boards located in the top of this stove, in two layers. While the bottom layer is oriented 'North/South' as shown, the top layer is oriented 'East/West'. To replace a cracked or broken board, first remove the front burner tube. Then remove the board you need to replace. Install the new board (the boards should sit flush together side by side). Replace the tube previously removed.



Dog box replacement

See Brick Layout (page 33) for dog box location in the firebox.

To replace the dog box, first remove the ash pan. Then remove the two 9/16" nuts that hold the carriage bolts in place. Open the front door of the stove and lift up on the dog box. Install new or existing carriage bolts into the holes on the flange of the dog box and re-install in the reverse manner in which it was removed.

Heat shield removal

There are two 5/16" screws that are on the rear of the heat shield. To remove the heat shield, using a 5/16" socket or open ended wrench, remove the two screws. Then pull the heat shield up and back off the back panel.

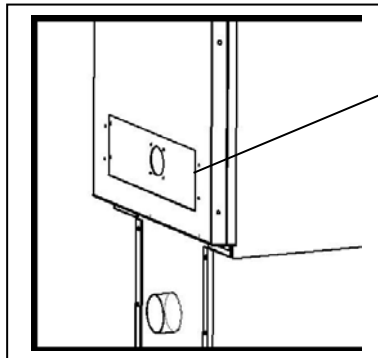
OPTIONAL ACCESSORIES

Blower: The wood stove was also designed for use with a convection blower for additional heat circulation. The stove is constructed with side convection channels which allow the room air blower to pick up heat from the hottest regions of the stove and transfer it into the home. The mounting screws for the blower are installed into the rear convection channel at the factory; mounting the blower only requires a 5/16" open end or socket wrench to remove these screws and install the blower.

When routing the power cord, take care to keep away from hot areas of the unit and remember that this blower is for use only with the stove. Please see the diagram below for clarification on the room air blower installation.

This unit can use the AC-16 (which comes standard with the unit) or the AC-30 upgrade blower. Both are installed using the four factory installed 5/16" screws.

The optional heat circulation blower on this stove requires periodic lubrication; this lubrication should be performed no less than every three months of normal operation. To properly lubricate the blower, use an eye dropper or similar dispensing device to drip 5-7 droplets of SAE 20 oil into the oil port on the side of the blower motor.



(4) 5/16" head, self-tapping screws (pre-installed in unit).

Warning: Disconnect power from fan before installation.

The unit should be unplugged during the summer months (and periods of non-use), to help protect against the possibility of damage due to lightning strikes and other power disruptions.

EPA Certified to comply with 2020 particulate emission standards using cord wood.

EPA INFORMATION

The following additions to your owner's manual will enable you to achieve optimal emissions performance from your stove. Important safety tips are also included.

- *Proper Installation* – Please refer to the Installation section of your owner's manual and follow the guidelines listed therein for safety and for optimal emissions performance.

Additional information:

Venting Introduction:

Draft: Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may damage the catalytic combustor. Inadequate draft may cause backpuffing into the room and 'plugging' of the chimney or the catalyst.

Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints.

An uncontrollable burn or excessive temperature indicates excessive draft.

Please be mindful of installation location: Inversion and other air quality issues can arise in valleys or if unit is installed close to neighboring homes.

This wood stove operates on a natural draft system, in which the chimney system pulls air through the stove. This unit must be installed in accordance with the following detailed descriptions of venting techniques; not installing the stove in accordance with the details listed here can result in poor stove performance, property damage, bodily injury or death. Avoid make-shift compromises when installing the venting system. England's Stove Works is not responsible for any damage incurred due to a poor or unsafe installation.

Be certain that all aspects of the venting system are installed to the venting manufacturer's instructions, particularly the required clearances to combustibles. Also, be certain to use an attic radiation shield to prevent insulation from contacting a chimney which passes through an attic.

The chimney system is the "engine" which drives a wood stove, so it is imperative for proper unit function that the venting system be installed exactly as described in the following section.

If questions arise pertaining to the safe installation of the stove, our Technical Support line (800-245-6489) is available. Contact your local code official to be certain your installation meets local and national fire codes, and if you're uncertain about how to safely install the stove, we strongly recommend contacting a local NFI certified installer to perform the installation.

Venting Guidelines:

ALWAYS install vent pipe in strict adherence to the instructions and clearances included with your venting system.

- **DO NOT** connect this wood stove to a chimney flue which also serves another appliance.
- **DO NOT** install a flue pipe damper or any other restrictive device in the exhaust venting system of this unit.
- **USE** an approved wall thimble when passing through a wall and a ceiling support/fire stop when passing through a ceiling.
- **INSTALL** three sheet metal screws at every chimney connector joint.
- **AVOID** excessive horizontal runs and elbows, as both will reduce the draft of the venting system and will result in poor stove performance.
- **INSPECT** your venting system often, to be certain it is clear of creosote, fly-ash and other restrictions.
- **CLEAN** the venting system as detailed in the maintenance section of this manual.
- **ADHERE** to the 10-3-2 rule regarding chimney terminations.
- **INSTALL** single wall chimney connector with the male end **down** to prevent creosote leakage. Follow double wall chimney connector manufacturer's instructions regarding proper pipe installation.

WARNING: Venting system surfaces get HOT, and can cause burns if touched. Noncombustible shielding or guards may be required

The 10-3-2 Rule: The chimney system must terminate 3.0 ft above the point where it's centerline passes through the roof AND the chimney must terminate 2.0 ft. above part of the dwelling within a 10 ft. radius of the chimney.

- *Operation and Maintenance* – Please refer to the 'Operation' (Operating Instructions) and Maintenance (including Ash Removal/Disposal) sections of your owner's manual and follow the guidelines listed therein for safety *and* for optimal emissions performance.

Additional Information:

Following the instructions in your owner's manual for Building a Fire will ensure a proper fire, as well as helping minimize visible emissions.

More:

- *Fuel loading and re-loading:* Practical Tips for Building a Fire – See your owner's manual for information on loading (and re-loading) your fuel, as well as for fire-starting procedures (i.e. 'Building a Fire').
- *Top-Down Fires:* The US EPA recognizes 'the effectiveness of the top-down approach for starting fires.' A good tutorial for this approach may be found at <http://woodheat.org/top-down-steps.html> . When building top-down fires, be sure to follow the instructions found in your owner's manual and contact our Technical Support if you have any questions.

- *Fuel Selection:* Once your wood-burning appliance is properly installed, building an effective fire requires good firewood (using the right wood in the right amount) and good fire building practices. The following practical steps will help you obtain the best efficiency from your wood stove or fireplace.
- Season wood outdoors through the summer for at least 6 months before burning it. Properly seasoned wood is darker, has cracks in the end grain, and sounds hollow when smacked against another piece of wood.
- Store wood outdoors, stacked neatly off the ground with the top covered.
- Burn only dry, well-seasoned wood that has been split properly.
- Start fires with newspaper and dry kindling as discussed earlier in the manual.
- Burn hot fires.
- To maintain proper airflow, regularly remove ashes from your wood-burning appliance into a metal container with a cover and store outdoors.

Moisture Meter Information

- Firewood is ready at 10-25% moisture content.
- Newly-cut logs can have a moisture content (MC) of 80% or more, depending on species. Since wood shrinks, and can also split, twist or otherwise change shape as it dries, most wood is dried before being used. Air drying, or 'seasoning,' is the most common method used for cord wood. In most parts of the United States, the minimum moisture content that can be generally obtained in air drying is about 12 to 15 percent. Most air-dried material is usually closer to 20 percent moisture content when used
- To test your firewood, simply push the pins into the wood and wait for a reading. Remember, **don't just stick the meter into the ends of your firewood.** To get the most accurate reading, split the wood and test the center. The center of the log will contain the most moisture.

How Far Should I Drive Non-Insulated Pins into Wood?

- To full depth if possible. However, at moisture levels below 10%, it is usually sufficient to make good, positive contact with the wood. At higher levels of moisture and especially if you have a steep gradient, full penetration is a must.

- **WHAT FUELS NOT TO USE:**

CAUTION

- **NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR “FRESHEN UP” A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER WHILE IN USE. ADDITIONALLY, NEVER APPLY FIRE-STARTER TO ANY HOT SURFACE OR EMBERS IN THE STOVE. DO NOT USE CHEMICALS OR FLUIDS**
 - **TO START THE FIRE.**
- **DO NOT BURN FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTHA OR ENGINE OIL.**
- **DO NOT BURN GARBAGE; LAWN CLIPPINGS OR YARD WASTE; MATERIALS CONTAINING RUBBER, INCLUDING TIRES; MATERIALS CONTAINING PLASTIC; WASTE PETROLEUM PRODUCTS, PAINT 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; PAPER PRODUCTS, CARDBOARD, PLYWOOD OR PARTICLEBOARD. THE PROHIBITION AGAINST BURNING THESE MATERIALS DOES NOT PROHIBIT THE USE OF FIRESTARTERS MADE FROM PAPER, CARDBOARD, SAWDUST, WAX AND SIMILAR SUBSTANCES FOR THE PURPOSE OF STARTING A FIRE IN AN AFFECTED WOOD HEATER. BURNING THESE MATERIALS MAY RESULT IN RELEASE OF TOXIC FUMES OR RENDER THE HEATER INEFFECTIVE AND CAUSE SMOKE.**

- **Safe Wood-burning Practices**

Once your wood-burning appliance is properly installed, follow these guidelines for safe operation:

- Keep all flammable household items—drapes, furniture, newspapers, and books—far away from the appliance.
- Start fires only with newspaper, dry kindling and all natural or organic fire starters. Never start a fire with gasoline, kerosene, or charcoal starter.
- Do not burn wet or green (unseasoned) logs.
- Do not use logs made from wax and sawdust in your wood stove – they are made for open hearth fireplaces. If you use manufactured logs, choose those made from 100 percent compressed sawdust.
- Build hot fires. For most appliances, a smoldering fire is not a safe or efficient fire.
- Keep the doors of your wood-burning appliance closed unless loading or stoking the live fire. Harmful chemicals, like carbon monoxide, can be released into your home.
- Regularly remove ashes from your wood-burning appliance into a metal container with a cover. Store the container of ashes outdoors on a cement or brick slab (not on a wood deck or near wood). See ash removal instructions in your owner’s manual.
- Keep a fire extinguisher handy.
- Remember to check your local air quality forecast before you burn.

- *Air Controls*: SEE YOUR OWNER’S MANUAL for information on the Proper Use of Air Controls (in the Operation section).
- *ASH REMOVAL* – Follow your Owner’s manual’s instructions regarding removal and disposal of ashes.
- *REPLACEMENT of parts that are critical to emissions performance* – Follow your Owner’s manual’s instructions regarding replacement of gaskets and other parts that are critical to emissions performance.

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

More: Burner Tubes – To replace a tube, first be sure that you order the correct tube you need to replace. Then using a 5/16” socket or open end wrench, remove the screw located on the left side of the tube. Be sure to keep the screw. Push the tube to the right then remove the tube (pulling the tube back to the left after that side has been removed from the hole). To replace, reverse the above procedure...make sure to install the tubes in the correct order. (Front to Back)

- **Smoke Detectors**

England’s Stove Works, Inc. highly recommends the use of smoke detectors in every room of the house. However, locating a smoke detector directly above this unit can result in nuisance alarms.

CAUTION

This unit is meant to operate only with door closed. Smoke spillage and an inefficient, lazy burn will result from attempting to operate the stove with the door open.

Additionally, using prohibited fuels can create an unsafe situation and can also generate excess carbon monoxide. Carbon monoxide is an odorless, colorless gas which can be deadly.

The use of a carbon monoxide detector is strongly recommended.

Compliance: EPA Certified to comply with 2020 particulate emission standards using cord wood.

- *Tamper Warning*: “This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.”
- *Warranty*: See your Owner’s manual for a Warranty Registration instruction page, as well as instructions for warranty procedures. For parts, warranty replacement procedures may be found at our parts store site: www.heatredefined.com

TROUBLESHOOTING

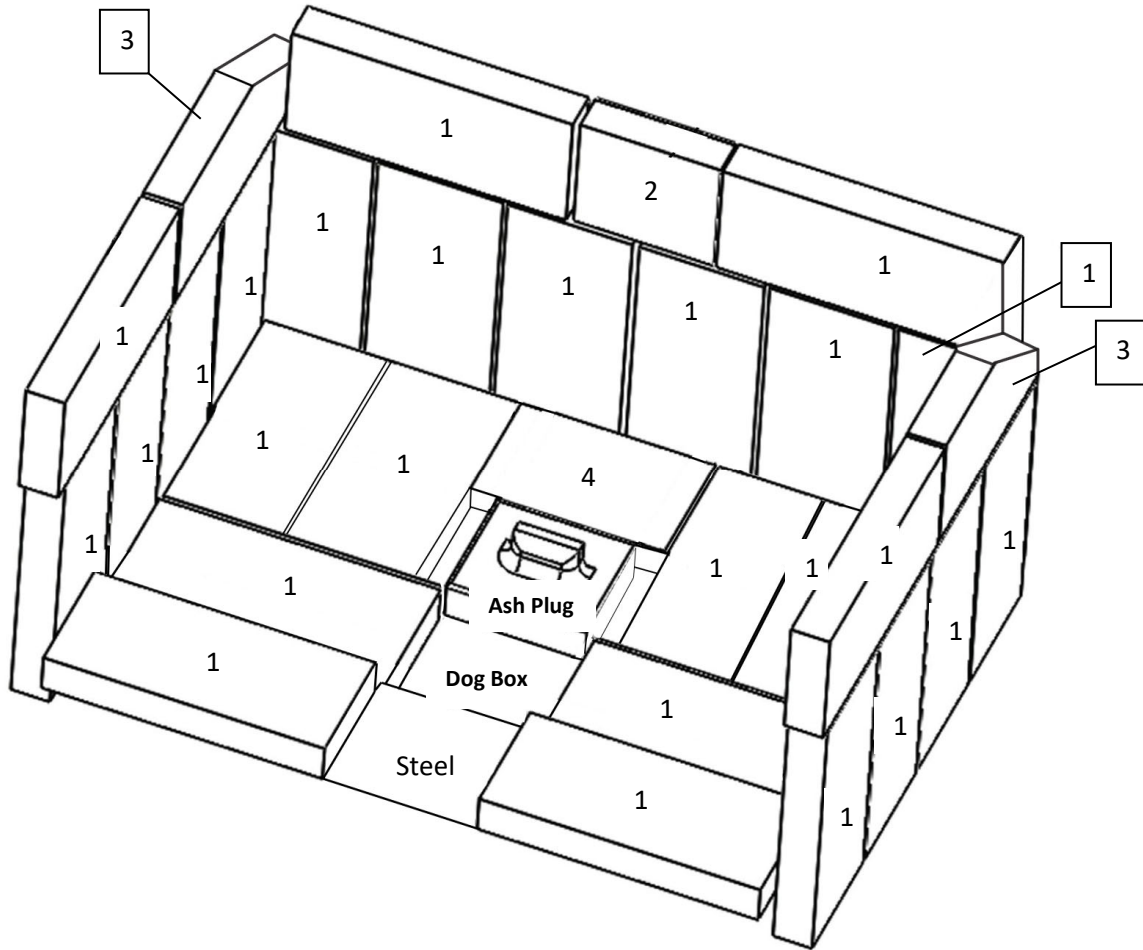
Issue	Cause	Solution(s)
Stove smokes into room	1. Weak Draft	1.1 Be certain chimney is sufficiently tall to meet the 10-3-2 rule.
		1.2 Add additional height to the chimney.
Fire is hard to start	2. Negative Pressure in the Home	2.1 Add an outside combustion air hookup to the unit.
	3. Weak Draft	3.1 Be certain chimney is sufficiently tall to meet 10-3-2 rule.
		3.2 Add additional height to the chimney system.
	4. Cold Chimney	4.1 Heat the flue first by burning crumbled newspaper in the stove.
		4.2 Install an insulated chase around external chimneys.
5. Downdraft in Chimney	5.1 Be certain chimney is sufficiently tall to meet 10-3-2 rule.	5.2 Try heating the flue with a hair-dryer to correct the draft.
Glass is dirty	6. Wet or Green Wood	6.1 Only burn wood that is seasoned for at least one year and that is dry and free of ice and snow.
	7. Operating Stove at Low Burn Rate	7.1 Operate the stove at higher burn rates to allow the air-wash system to keep the glass clean.
	8. Wood Loaded Too Close to Glass	8.1 Never load wood so that it is touching the ceramic glass viewing window.
Coals build up in firebox	9. Operating Stove at High Burn Rates	9.1 Reduce combustion air control and allow coals to burn down before reloading.
Fire burns out of control	10. Excessive Draft	10.1 Reduce chimney height.
	11. Air Leakage	11.1 Inspect window and door gaskets and replace if necessary.
	12. Burning Excessively Dry Wood	12.1 Only burn seasoned cord wood. Do not burn kiln dried wood or pallet wood.
Excessive smoke from stack	13. Operating Stove at Low Burn Rate	13.1 Operate the stove at a higher burn rate which will create secondary combustion.
	14. Wet or Green Wood	14.1 Only burn wood that is seasoned for at least one year and that is dry and free of ice and snow.
	15. Not Charring Fresh Wood Load	15.1 Char the fresh wood load until it is completely ignited and active secondary combustion is present in the firebox.

REPLACEMENT PARTS LIST

Description	Part No.	Per Unit
Rear heat shield (BOLT ON)	AC-W02HS	1
Rear panel (BOLT ON)	AC-W02RP	1
Ash drawer	AC-ADW01	1
Door	CA-W02	1
Side heat shields	AC-W01SHS	2
Large Upgrade Blower (optional)	AC-30	1
Small standard blower	AC-16	1
Glass gasket kit 3/4" flat	AC-GGK	1
Door gasket kit 3/4" high density	AC-DGKHD	1
Front burner tube	AC-W06FBT	1
Middle burner tube	AC-W02MBT	1
Rear burner tube	AC-W02RBT	1
Glass size 20.75" X 12.625"	AC-G51	1
Ceramic fiberboard	AC-W02CFB	4
Small spring handle, Nickel	AC-SH4N	1
Large spring handle, Nickel	AC-SHN	1
Blower back cover	AC-BBC30	1
Glass tabs	AC-W01GT	4
Hinge pins	AC-HP	2
Outside Air Kit	AC-OAK3	1
Air Dog Box	AC-DB02	1

***FOR BRICK LAYOUT AND PART NUMBERS PLEASE
SEE PAGE 33***

BRICK LAYOUT AND REPLACEMENT



NOTE: The bricks on the sides and rear will need to be installed after delivery

DIAGRAM NUMBER	BRICK SIZE	PART NUMBER	QUANTITY PER STOVE
1	9" X 4" X 1.25"	AC-SB	26
2	4.25" X 4" X 1.25"	AC-SB4.25	1
3	8" X 4" X 1.25" with Notch	AC-SB8x4	2
4	6.5" X 4" X 1.25"	AC-SB6.5	1
	ASH DUMP PLUG	CA-30ADP	1



Model 15-W06 50-SHW06 50-SHW06L 50-TRW06
 Solid Fuel Burning Room Heater; Free Standing Model "SUITABLE FOR
 MOBILE-HOME INSTALLATION"
 Certified to UL-1482 & ULC-627-00, EPA METHOD 28R, ASTM E3053-17,
 EPA Alt 125, CSA B415.1-10

W/N#

SERIAL NO.	<input type="text"/>
MFG. DATE	<input type="text"/>

Manufactured by:
 England's Stove Works, Inc.
 589 S. Five Forks Rd.
 Monroe, VA 24574

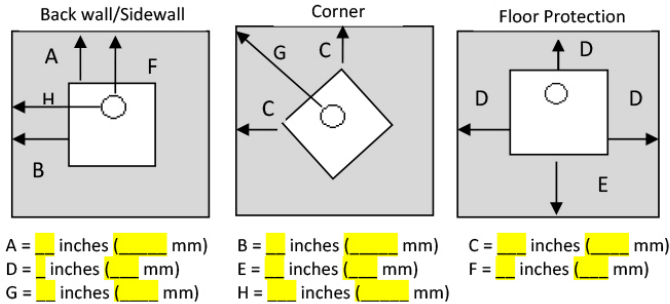
DO NOT REMOVE OR COVER THIS LABEL

- PREVENT HOUSE FIRES – INSTALL AND USE ONLY IN ACCORDANCE WITH THE OWNER'S MANUAL PROVIDED WITH THIS APPLIANCE.
- CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.

INSTALLATION REQUIREMENTS

- DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.
- USE A RESIDENTIAL TYPE MASONRY OR FACTORY BUILT CHIMNEY LISTED TO UL-103 HT (US) AND ULC-629 (CANADA).
- USE 24 GAUGE MSG BLACK SINGLE WALL CHIMNEY CONNECTOR OR LISTED DOUBLE WALL CHIMNEY CONNECTOR.
- REFER TO LOCAL CODES AND THE CHIMNEY MANUFACTURER'S INSTRUCTIONS FOR PRECAUTIONS REQUIRED FOR PASSING A CHIMNEY THROUGH A COMBUSTIBLE WALL OR CEILING.
- FOR THE US: PLACE ON A NON-COMBUSTIBLE TYPE FLOOR PROTECTOR WITH A R VALUE OF AT LEAST WHICH EXTENDS IN. TO THE FRONT AND IN. TO EACH SIDE OF THE FUEL LOADING OPENING.
- FOR CANADA: PLACE ON A NON-COMBUSTIBLE TYPE FLOOR PROTECTOR WITH A R FACTOR OF AT LEAST WHICH EXTENDS MM. TO THE FRONT AND MM. TO EACH SIDE OF THE FUEL LOADING OPENING.
- ADHERE TO THE LISTED MINIMUM CLEARANCES TO COMBUSTIBLES WHEN USING SINGLE WALL CHIMNEY CONNECTOR. SEE THE OWNER'S MANUAL FOR ADDITIONAL CLEARANCE INFORMATION.
- ONLY OPERATE THIS UNIT WITH THE DOOR CLOSED AND LATCHED TIGHTLY.
- THE MAIN LOADING DOOR CONTAINS A CERAMIC VIEWING WINDOW; DO NOT SLAM THE DOOR OR STRIKE THIS VIEWING WINDOW AT ANY TIME.
- IF THE GLASS IS CRACKED OR BROKEN, REPLACE WITH CERAMIC GLASS ONLY.
- EMISSION VALUE – 1.8 GRAMS/HR
- U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CORD WOOD.
- OPTIONAL PART- BLOWER PART NUMBER AC-30 (FASCO) ELECTRICAL RATING 115 V, 60 HZ., 0.8 A
- REFER TO PFS TECO'S DIRECTORY OF BUILDING PRODUCTS ([HTTP://WWW.PFSTECO.COM/BUILDING-PRODUCTS](http://www.pfsteco.com/building-products)) FOR DETAILED INFORMATION.

OPERATION REQUIREMENTS: FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT OVER-FIRE, IF HEATER OR CHIMNEY CONNECTOR GLOWS YOU ARE OVER-FIRING. INSPECT AND CLEAN CHIMNEY FREQUENTLY, UNDER CERTAIN CONDITIONS OF USE, CREOSOTE BUILDUP MAY OCCUR RAPIDLY. DO NOT USE A GRATE OR ELEVATE THE FIRE, BURN WOOD FIRE DIRECTLY ON THE HEARTH. RISK OF SMOKE AND FLAME SPILLAGE, OPERATE ONLY WITH DOOR FULLY CLOSED. This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.



CAUTION - HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING, AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. SEE NAMEPLATE AND INSTRUCTIONS.

You may write your unit's Manufacture Date and Serial Number in the blank spaces on this sample tag, for future reference. This sample tag also shows the safety info. such as UL (ULC) testing standard, etc. for your local officials, or anyone else who may need reference information.

For parts, warranty replacement procedures may be found at our parts store site:
heatredefined.com

LIMITED FIVE (5) YEAR WARRANTY

From the date of purchase to the original owner

The manufacturer extends the following warranties:

Five Year Period:

1. Carbon steel and welded seams in the firebox are covered for five (5) years against splitting.
2. The cast iron door and hinges are covered for five (5) years against cracking.

One Year Period:

1. Electrical components, accessory items, glass and the painted surface of the stove are covered for one (1) year from the date of purchase.

Conditions and Exclusions

1. Damage resulting from over-firing will void your warranty.
2. This warranty does not apply if damage occurs because of an accident, improper handling, improper installation, improper operation, abuse or unauthorized repair made or attempted to be made.
3. The manufacturer is not liable for indirect, incidental, or consequential damages in connection with the product including any cost or expense, providing substitute equipment or service during periods of malfunction or non-use.*
4. All liability for any consequential damage for breach of any written or implied warranty is disclaimed and excluded.
5. This warranty does not cover internal wear parts of the combustion system, including the firebrick lining and gaskets.
6. Warranty is void if unit is not used according to the owner's manual.

Some states do not allow the exclusion of limitations of incidental or consequential damages, so the above may not apply to you.

Procedure

Purchaser must give notice of claim of defect within the warranty period and pay transportation to and from a service center designated by the manufacturer. The dealer from which the unit was purchased or the factory, at our option, will perform the warranty service.

Other Rights

This warranty gives you specific legal rights; you may also have other rights, which may vary from state to state.

Important Notice

This registration information **MUST** be on file for this warranty to be valid. Please mail this information, along with a copy of the sales receipt, within thirty (30) days from the original date of purchase.

Use any of these three easy ways to send your warranty information in!

Mailing Address

England's Stove Works, Inc.
Technical Support Department
P.O. Box 206
Monroe, Virginia 24574

Fax Number

(434) 929-4810 – Twenty-four hours a day.

Online Registration

Visit our warranty registration website at:

www.heatredefined.com

(WARRANTY CARD LOCATED ON NEXT PAGE)

For parts, warranty replacement procedures may be found at our parts store site: www.heatredefined.com

WARRANTY REGISTRATION for England's Stove Works®

Purchaser Information

I. Purchased By (Name) _____

II. Address _____

III. City _____ State _____ Zip Code _____

IV. Telephone Number _____

V. Email Address _____

Dealer Information

VI. Purchased From _____

VII. Address _____

VIII. City _____ State _____ Zip Code _____

Unit Information

*Refer to the sticker on the back of the manual or box to complete this section.

IX. Model Number _____ Purchase Date _____

X. Purchase Price _____

XI. Serial Number _____ Mfg. Date _____

Purchase Questions

How did you first hear about our product? (Please check one)

Word of Mouth _____ Burn Trailer Demonstration _____ Internet _____

Other: _____

Where did you receive information about our product?

Via Telephone _____ Dealer (Name of dealer) _____ Internet _____

Other: _____



QUALITY CONTROL SERVICES

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



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

Report Number: DIRI01A05026191031

A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Rice Lake	IQ+355E-2A x 100C	A05026	#041	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
lbs	0.1	QC033	10/31/19	6/10/19	6/2020

FUNCTIONAL CHECKS

SHIFT TEST		LINEARITY		REPEATABILITY		ENVIRONMENTAL CONDITIONS		
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
250	0.3	HB44	HB44	100	0.1	Good	Fair	Poor
As-Found:		As-Found:		As-Found:		Temperature: 10°C		
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>			
As-Left:		As-Left:		As-Left:				
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>			

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	1001.2	1000.4	0.12
700	700.4	700.1	0.12
500	500.2	499.9	0.08
300	300.0	299.9	0.08
100	100.0	99.9	0.05
50	50.0	50.0	0.05

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	.001 to 10lb	PW0990	10/4/18	10/2020	20181977

Permanent Information Concerning this Equipment:

10/19 New platform. Rice Lake sn# 128929

Comments/Information Concerning this Calibration

10/19 RH = 40%.

Report prepared/reviewed by: R. B. Date: 10-31-19

Technician: R. Butcher

Signature: R. Butcher

THIS CERTIFICATE SHALL NOT BE REPRODUCED, EXCEPT IN FULL, 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 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.



QUALITY CONTROL SERVICES

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



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

Report Number: DIRI01D01487W16P190610

A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digi-Weigh	DWP-440 400 x 0.1	D01487W16P	N/A	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
lbs	0.1	QC033	6/10/19	N/A	6/2020

FUNCTIONAL CHECKS

SHIFT TEST		LINEARITY		REPEATABILITY		ENVIRONMENTAL CONDITIONS		
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
100	0.5	HB44	HB44	50	0.1	Good	Fair	Poor
As-Found:		As-Found:		As-Found:		Temperature: 20.6°C		
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>			
As-Left:		As-Left:		As-Left:				
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>			

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	400.22	400.00	0.08
300	300.19	300.00	0.08
200	200.15	200.00	0.08
100	100.09	100.00	0.05
50	50.04	50.00	0.05
25	25.02	25.00	0.05

CALIBRATION STANDARDS

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

Permanent Information Concerning this Equipment:

12 month calibration cycle

Comments/Information Concerning this Calibration

6/19 RH= 47%. Adjusted span.

Report prepared/reviewed by: ServiceTech Date: 6/11/19

Technician: J. Colacchio

Signature: _____

THIS CERTIFICATE SHALL NOT BE REPRODUCED, EXCEPT IN FULL, 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 of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy.

Dry Gas Meter Calibration

Meter Manufacturer: Apex
 Model: XC-60-ED
 Lab ID #: 53
 Serial #: 1902130
 Calibration Date: 1/23/2020
 Calibration Expiration: 7/23/2020
 Barometric Pressure: 29.93 in. Hg



Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	6/14/2019
γ Factor:	0.999
Allowable Deviation ($\pm 5\%$):	0.04995
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	162.364	142.013	148.622
Standard DGM Temperature ($^{\circ}$ F)	69.0	70.0	70.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	5.814	5.147	5.409
DGM Temperature ($^{\circ}$ F)	88.0	94.0	96.0
DGM Pressure (in H ₂ O)	3.42	2.04	1.0
Time (min)	32.0	36.0	52.0
Net Volume for Standard DGM (ft ³)	5.734	5.015	5.249
Net Volume for DGM (ft ³)	5.814	5.147	5.409

Dry Gas Meter γ Factor	1.011	1.011	1.013
γ Factor Deviation From Average	1.011	1.011	1.013

Average Gas Meter γ Factor

1.012

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{std} \times (\gamma_{std}) \times (P_{bar} + P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is $\pm 0.5\%$.

Dry Gas Meter Calibration

Meter Manufacturer: Apex
 Model: XC-60-ED
 Lab ID #: 54
 Serial #: 1902133
 Calibration Date: 1/23/2020
 Calibration Expiration: 7/23/2020
 Barometric Pressure: 23.93 in. Hg



Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	6/14/2019
γ Factor:	0.996
Allowable Deviation ($\pm 5\%$):	0.0498
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	153.663	172.691	287.542
Standard DGM Temperature ($^{\circ}$ F)	69.0	69.0	69.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	5.576	6.296	10.530
DGM Temperature ($^{\circ}$ F)	95.0	95.0	96.0
DGM Pressure (in H ₂ O)	3.60	2.00	1.0
Time (min)	30.0	45.0	99.0
Net Volume for Standard DGM (ft ³)	5.427	6.099	10.154
Net Volume for DGM (ft ³)	5.576	6.296	10.530
Dry Gas Meter γ Factor	1.008	1.008	1.008
γ Factor Deviation From Average	1.008	1.008	1.008

Average Gas Meter γ Factor 1.008

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{std} \times (\gamma_{std}) \times (P_{bar} + P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is $\pm 0.5\%$.

Technician:



QUALITY CONTROL SERVICES

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



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

Report Number: DIR10134307497200110

A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Sartorius	ENTRIS224-1S	34307497	#107	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
g	0.0001	QC012	1/10/20	6/10/19	6/2020

FUNCTIONAL CHECKS

ECCENTRICITY		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"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
As-Found:		As-Found:		1. 100.0001	5. 99.9999	9. 100.0000	Good Fair Poor
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	2. 100.0000	6. 100.0000	10. 99.9999	
As-Left:		As-Left:		3. 100.0000	7. 100.0001	Result	Temperature: 19.3°C
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	4. 100.0000	8. 100.0000	0.00006	

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9997	200.0000	0.00019
100	100.0000	100.0001	0.00018
50	49.9999	50.0001	0.00018
20	20.0001	20.0000	0.00017
1	0.9998	0.9999	0.00017
0.1	0.0999	0.1000	0.00017

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20kg to 1mg	7133	4/19/19	4/2020	20190811

Permanent Information Concerning this Equipment:

Comments/Info Concerning this Calibration:

01/20 RH= 49% Adjusted span.

Report prepared/reviewed by: R.B. Date: 1-10-20

Technician: R. Butcher

Signature: R. Butcher

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.

Member: National Conference of Standards Laboratories and Weights & Measures

PT ID: DIR101

Certificate of Calibration

Certificate Number: **712600**



JJ Calibrations, Inc.

7724 SE Aspen Summit Drive

Portland, OR 97266-9217

Phone 503.786.3005

FAX 503.786.2994

PFS TECO

11785 SE Hwy 212

Suite 305

Clackamas, OR 97015

PO: **john.steinst.PFSTECO.co**

Order Date: **11/06/2019**

Authorized By: **N/A**



Calibrated on: **11/15/2019**

*Recommended Due: **11/15/2020**

Environment: **21 °C 48 % RH**

* As Received: **Within Tolerance**

* As Returned: **Within Tolerance**

Action Taken: **Calibrated**

Technician: **146**

Property #: **064**

User: **N/A**

Department: **N/A**

Make: **Control Company**

Model: **4198**

Serial #: **80531676**

Description: **Digital Temp. / Barometer**

Procedure: **404323**

Accuracy: **±1°C ±0.2362Hg(±8mb)**

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

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
644A	Thunder Scientific	1200	Two Pressure Humidity Generator	10/14/2020	710583
847A	Fluke	RPM4	Reference Pressure Monitor	11/21/2019	688957

Parameter

Measurement Data

Measurement Description	Range Unit	Reference	Min	Max	^k Error	UUT	Uncertainty
Before/After Temperature	°C	20.00	19.0	21.0	0.1	20.1 °C	8.1E-02 ✓
	°C	30.00	29.0	31.0	0.8	29.2 °C	8.1E-02 ✓
	°C	40.00	39.0	41.0	0.2	39.8 °C	8.1E-02 ✓
Barometer	mbar	1010.70	1002.7	1018.7	0.7	1010.0 mbar	

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


Reviewer

3 Issued 11/16/2019 Rev # 15


Inspector



QUALITY CONTROL SERVICES

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



Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17
Submitted By: John Steiner
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner

<u>Material</u>	<u>Assumed Density</u>	<u>Range</u>	<u>Tolerance Class</u>
Stainless Steel	7.95 g/cm ³	200mg & 100mg	ASTM Class 1

Method and Traceability

The procedure used for this calibration is NIST IR 6969 SOP 4 Double Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:

100g to 1mg Working Standards Were Calibrated: 03/03/17 Due: 03/31/18 Standards ID: 723318
Mass Comparators Used: MET-05 Tested by: D. Thompson

Conventional Mass: “The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). “Conventional Value of the Result of Weighing in Air” (Previously known as “Apparent Mass vs. 8.0g/cm³”).

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

Date: 03/21/17

Signature David S. Thompson

This document shall not be reproduced, except in full, without the written approval of Quality Control Services Mass Laboratory.

Member: National Conference of Standards Laboratories and Weights & Measures



QUALITY CONTROL SERVICES

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



Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17
Submitted By: John Steiner
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.967	753.44	49.44

Conventional Mass Value

Nominal Value	As Found grams	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200mg SN 1000101395	0.2000061	0.0061	0.0026	0.01
100mg SN 1000126267	0.1000046	0.0046	0.0028	0.01

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were new from the manufacturer and were within ASTM Class 1 tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

page 2 of 2

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson



QUALITY CONTROL SERVICES

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



Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 01/15/16
Purchase Order: 1001
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights
Serial No.: Listed in Table

Manufacturer: Unknown

<u>Material</u>	<u>Assumed Density</u>	<u>Range</u>	<u>Tolerance Class</u>
Cast Iron	7.2 g/cm ³	20lb to 10lb	NIST HB 105-1 (F)

Method and Traceability

The procedure used for this calibration is NIST IR 6969 SOP 7 Single 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:

Avoirdupois Working Standards were calibrated: 06/18/2014 Due: 06/18/2016 Standards ID: 34AA

Mass Comparators Used: MET-09, 20

Tested by: D. Thompson

Conventional Mass: "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). "Conventional Value of the Result of Weighing in Air" (Previously known as "Apparent Mass vs. 8.0g/cm³).

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

Date: 01/15/16


Signature David S. Thompson

This document shall not be reproduced, except in full, without the written approval of Quality Control Services Mass Laboratory.

Member: National Conference of Standards Laboratories and Weights & Measures



QUALITY CONTROL SERVICES

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



Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 01/15/16
Purchase Order: 1001
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights
Serial No.: Listed in Table

Manufacturer: Unknown

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.448	760.64	44.58

Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
20lb #098	19.9995450	-206.4	6.4	910
10lb #097	10.0006510	295.3	5.1	450
10lb #051	10.0003421	155.2	5.1	450

*Correction is the difference between the conventional mass value of a weight and its nominal value.


Comments: These weights were received in good condition and were within NIST Handbook 105-1 Class F tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

page 2 of 2

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 01/15/16


Signature David S. Thompson



QUALITY CONTROL SERVICES

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



Report of Calibration

Firm: PFS Teco
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 08/27/18
Submitted By: John Steinert
Traceable Number: 20181772

Test Item: 5 lb Individual Grip Handle Weight
Serial No.: 10744

Manufacturer: Rice Lake

<u>Material</u>	<u>Assumed Density</u>	<u>Range</u>	<u>Tolerance Class</u>
Cast Iron	7.2 g/cm ³	5 lb	ASTM Class 7

Method and Traceability

The procedure used for this calibration is NIST IR 6969 SOP 7 Single 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:

20 kg to 200 g Working Standards Were Calibrated: 03/22/18 Due: 03/31/19 Standards ID: 75388
100 g to 1 mg Working Standards Were Calibrated: 04/04/18 Due: 04/30/19 Standards ID: 723318

Mass Comparators Used: MET-08

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/cm³”).


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

Date: 08/28/18


Signature David S. Thompson

This document shall not be reproduced, except in full, without the written approval of Quality Control Services Mass Laboratory.

Member: National Conference of Standards Laboratories and Weights & Measures



QUALITY CONTROL SERVICES

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



Report of Calibration

Firm: PFS Teco
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 08/27/18
Submitted By: John Steinert
Traceable Number: 20181772

Test Item: 5 lb Individual Grip Handle Weight
Serial No.: 10744

Manufacturer: Rice Lake

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.838	762.06	52.23

Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
5 lb	5.0006085	276.0	2.0	760

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: This weight was new from the manufacturer and was within ASTM Class 7 tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

page 2 of 2

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 08/28/18

Signature David S. Thompson

This document shall not be reproduced, except in full, without the written approval of Quality Control Services Mass Laboratory.

Tape Measure Calibration

Rule Equipment ID: 101

Date: 1/23/2020

Std. Gage Block ID: 146

Ambient (F): 70

Cal. Expiration Date: 1/7/2023

Technician: AK

Std. Surface Plate ID: 147

Cal. Expiration Date: 1/3/2023

System: Imperial Metric



Visual Inspection

Pass Fail

Full Length Operation Check

Pass Fail

Tape in Tension

Tolerance: 0.1

Standard	Measured
1.0	1.0
6.0	6.0

Within Tolerance

Tape in Compression

Tolerance: 0.1

Standard	Measured
1.0	1.0
6.0	6.0

Within Tolerance

Body Length

Tolerance: 0.1

Standard	Measured
3.0	3.0

Within Tolerance

Calibration Due

1/23/2021

Notes

Technician Signature

A handwritten signature in black ink on a light gray background.

Caliper Calibration

Caliper Equipment ID: 117

Date: 1/23/2020

Std. Gage Block ID: 146

Ambient (F): 70

Cal. Expiration Date: 1/10/2023

Technician: AK

Std. Surface Plate ID: 147

Cal. Expiration Date: 1/3/2023

System: Imperial Metric



Visual Inspection

Pass Fail

Outside Jaws

Tolerance: 0.002

Standard	Measured
0.050	0.050
0.250	0.250
1.000	1.000
2.000	2.001
6.000	5.999

Within Tolerance

Inside Jaws

Tolerance: 0.005

Standard	Measured
0.050	0.050
0.250	0.248
1.000	0.999
2.000	1.999
6.000	6.001

Within Tolerance

Depth

Tolerance: 0.005

Standard	Measured
0.050	0.056

Out of Tolerance

Calibration Due

1/17/2021

Notes

Depth gauge found out of tolerance and therefore removed

Calibration covers only inside & outside jaws

Technician Signature

CERTIFICATE OF CALIBRATION

CUSTOMER:	PFS-TECO : CLACKAMAS, OR	CALIBRATION DATE:	03/14/2019
PO NUMBER:	N/A	CALIBRATION DUE:	03/14/2020
INST. MANUFACTURER:	DWYER	PROCEDURE:	T.O.33K6-4-1769-1
INST. DESCRIPTION:	VELOMETER	CALIBRATION FLUID:	AIR @ 14.7 PSIA 70°F
MODEL NUMBER:	471	RECEIVED CONDITION:	WITHIN MFG. SPECS.
SERIAL NUMBER:	CP288559 (ID# 095)	LEFT CONDITION:	WITHIN MFG. SPECS.
RATED UNCERTAINTY:	SEE NOTES BELOW.	AMBIENT CONDITIONS:	762 mm HGA 43% RH 69°F
UNCERTAINTY GIVEN:	± .20% RD ; k=2	CERTIFICATE FILE #:	490265.2019
NOTES:	± 3% FS (0-500 / 0-1500) *** ± 4% F.S. (0-5000) ***± 5% F.S. (0-15000) *** ± 2 °F		
NOTES CONT. :	Q.MANUAL IM 1.5 REV 2017.1 DATED 7-18-2017		

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM STD. ACTUAL DEG. F
64	65	0 TO 200°F	0 TO 200°F
110	112	43.4	43.5
206	210	69.0	68.9
498	509	99.4	99.2
503	505		
1049	1058		
1497	1514		
509	513		
3419	3460		
4992	5068		
5136	5235		
13928	14232		

STANDARDS USED:

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

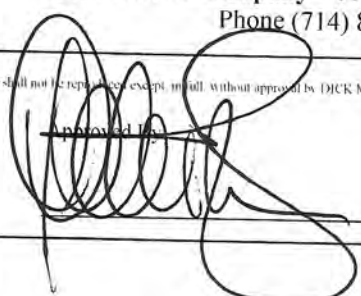
All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) used and the unit under test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed per the shown procedure number, in accordance with ISO 10012:2003, ISO 17025:2005, ANSI/NC SL-Z-540.3, and/or MIL-STD-45662A. Test methods: API2530-92 & ASME MFC-3M-1989.

Dick Munns Company • 11133 Winners Circle • Los Alamitos, CA 90720
Phone (714) 827-1215 • Fax (714) 827-0823

This Calibration Certificate shall not be reproduced, except in full, without approval by DICK MUNNS COMPANY. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Date:

3/14/2019



Calibration Technician:

D.C.



Model 1430 Microtector® Electronic Point Gage

Installation and Operating Instructions



Model 1430 Microtector® Portable Electronic Point Gage combines modern, solid-state integrated circuit electronics with a time-proven point gage manometer to provide fast, accurate pressure measurements.

SPECIFICATIONS AND FEATURES

- Accurate and repeatable to $\pm .00025$ inches water column
- Pressure range: 0 - 2" w.c., positive, negative, or differential pressures
- Non-toxic and inexpensive gage fluid consists of distilled water mixed with a small amount of fluorescein green color concentrate
- Convenient, portable, lightweight and self-contained, the unit requires no external power connections and is operated by a 1.5 volt penlight cell
- A.C. detector current eliminates point plating, fouling and erosion
- Micrometers are manufactured in accordance with ASME B89.1.13-2001, and are traceable to a standard at the National Institute of Standards and Technology

- Three-point mounting, dual leveling adjustment, and circular level vial assure rapid setup
- Durablock® precision-machined acrylic plastic gage body
- Sensitive 0 - 50 microamp D.C. meter acts as a detector and also indicates battery and probe condition
- Heavy 2" thick steel base plate provides steady mounting
- Top-quality glass epoxy circuit board and solid-state, integrated circuit electronics
- Electronic enclosure of tough, molded styrene acrylonitrile provides maximum protection to components yet allows easy access to battery compartment
- Rugged sheet steel cover and carrying case protects the entire unit when not in use
- Accessories included are (2) 3-foot lengths Tygon® tubing, (2) 1/8" pipe thread adapters and 3/4 oz. bottle of fluorescein green color concentrate with wetting agent

Maximum pressure: 100 psig with optional pipe thread connections.

Tygon® is a registered trademark of Saint-Gobain Corporation

DWYER INSTRUMENTS, INC.

P.O. BOX 373

MICHIGAN CITY, INDIANA 46361, U.S.A.

Phone: 219/879-8000

Fax: 219/872-9057

www.dwyer-inst.com

e-mail: info@dwyer-inst.com

J-2000

owner's manual



DELMHORST[®]
INSTRUMENT CO.

WHEN ACCURACY IS THE POINT.[™]



CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

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

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

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

Certified Concentration

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

ProSpec EZ Cert



Certification Information:

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

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

Analytical Data:

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

1. Component: Carbon dioxide

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

First Analysis Data:				Date
Z: 0	R: 20.1	C: 17	Conc: 17	10/01/2018
R: 20.1	Z: 0	C: 17	Conc: 17	
Z: 0	C: 17.01	R: 20.11	Conc: 17.01	
UOM: %				Mean Test Assay: 17 %

Reference Standard: Type / Cylinder #: GMIS / CC187238
Concentration / Uncertainty: 20.10 % ±0.24%
Expiration Date: 06/07/2026

Traceable to: SRM # / Sample # / Cylinder #: RGM#CC193512 / NIA / RGM#CC193512
SRM Concentration / Uncertainty: 26.99% / ±0.05%
SRM Expiration Date: 05/15/2023

Second Analysis Data:				Date
Z: 0	R: 0	C: 0	Conc: 0	
R: 0	Z: 0	C: 0	Conc: 0	
Z: 0	C: 0	R: 0	Conc: 0	
UOM: %				Mean Test Assay: %

2. Component: Carbon monoxide

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

First Analysis Data:				Date
Z: 0	R: 5	C: 4.31	Conc: 4.31	10/01/2018
R: 5	Z: 0	C: 4.3	Conc: 4.3	
Z: 0	C: 4.32	R: 5.01	Conc: 4.32	
UOM: %				Mean Test Assay: 4.31 %

Reference Standard: Type / Cylinder #: GMIS / CC242633
Concentration / Uncertainty: 5.00 % ±0.543%
Expiration Date: 04/03/2025

Traceable to: SRM # / Sample # / Cylinder #: SRM 2642a / 51-D-23 / FF23106
SRM Concentration / Uncertainty: 7.859% / ±0.039%
SRM Expiration Date: 07/15/2019

Second Analysis Data:				Date
Z: 0	R: 0	C: 0	Conc: 0	
R: 0	Z: 0	C: 0	Conc: 0	
Z: 0	C: 0	R: 0	Conc: 0	
UOM: %				Mean Test Assay: %

3. Component: Oxygen

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

First Analysis Data:				Date
Z: 0	R: 20.86	C: 16.99	Conc: 16.99	10/01/2018
R: 20.86	Z: 0	C: 16.99	Conc: 16.99	
Z: 0	C: 16.99	R: 20.86	Conc: 16.99	
UOM: %				Mean Test Assay: 16.99 %

Reference Standard: Type / Cylinder #: GMIS / CC75874
Concentration / Uncertainty: 20.86 % ±0.111%
Expiration Date: 11/07/2025

Traceable to: SRM # / Sample # / Cylinder #: SRM 2659a / 71-E-19 / FF22331
SRM Concentration / Uncertainty: 20.863% / ±0.021%
SRM Expiration Date: 08/23/2021

Second Analysis Data:				Date
Z: 0	R: 0	C: 0	Conc: 0	
R: 0	Z: 0	C: 0	Conc: 0	
Z: 0	C: 0	R: 0	Conc: 0	
UOM: %				Mean Test Assay: %

Analyzed By

Jose Vasquez

Certified By

Danielle Burns



CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

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

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

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

Certified Concentration

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

ProSpec EZ Cert



Certification Information:

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

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
Do Not Use this Standard if Pressure is less than 100 PSIG.

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

Analytical Data:

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

1. Component:

Carbon dioxide

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

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

First Analysis Data:				Date			
Z:	0	R:	14.02	C: 10	Conc:	10	
R:	14.02	Z:	0	C: 10	Conc:	10	
Z:	0	C:	10	R:	14.02	Conc:	10
UOM:	%	Mean Test Assay:		10	%		

Second Analysis Data:				Date			
Z:	0	R:	0	C: 0	Conc:	0	
R:	0	Z:	0	C: 0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%	Mean Test Assay:			%		

2. Component:

Carbon monoxide

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

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

First Analysis Data:				Date			
Z:	0	R:	2.48	C: 2.51	Conc:	2.51	
R:	2.48	Z:	0	C: 2.51	Conc:	2.51	
Z:	0	C:	2.51	R:	2.48	Conc:	2.51
UOM:	%	Mean Test Assay:		2.51	%		

Second Analysis Data:				Date			
Z:	0	R:	0	C: 0	Conc:	0	
R:	0	Z:	0	C: 0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%	Mean Test Assay:			%		

3. Component:

Oxygen

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

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

First Analysis Data:				Date			
Z:	0	R:	9.88	C: 10.49	Conc:	10.49	
R:	9.88	Z:	0	C: 10.5	Conc:	10.5	
Z:	0	C:	10.5	R:	9.88	Conc:	10.5
UOM:	%	Mean Test Assay:		10.5	%		

Second Analysis Data:				Date			
Z:	0	R:	0	C: 0	Conc:	0	
R:	0	Z:	0	C: 0	Conc:	0	
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%	Mean Test Assay:			%		

Analyzed By

Danielle Burns

Certified By

Jose Vasquez